

M. J. Dorsey

BOTANICAL ABSTRACTS

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BOTANICAL ABSTRACTS

A monthly serial furnishing abstracts and citations of publications in the international field of botany in its broadest sense.

UNDER THE DIRECTION OF

THE BOARD OF CONTROL OF BOTANICAL ABSTRACTS, INC.

J. R. SCHRAMM, Editor-in-Chief

FREDERICK V. RAND, Associate Editor-in-Chief

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Vol. 13

OCTOBER, 1924

No. 10

ENTRIES 6850-7498

AGRONOMY

C. V. PIPER, *Editor*

MARY R. BURR, *Assistant Editor*

(See also in this issue Entries 6925, 6979, 7142, 7498)

6850. ANONYMOUS. Efwatakala grass. Kew Bull. 1922: 305-316. 2 pl., 12 fig. 1922.—This grass known as *Melinis minutiflora* Beauv., and allied to the "Godura" of Brazil or the "Yaragua" fodder grass of Colombia, was studied by M. T. Dawe in 1921 [see Bot. Absts. 9, Entry 3298] in Angola, western tropical Africa. He noticed that the grass was sought by domesticated animals and also that it was inimical or distasteful to the tsetse fly, an almost unrestrained scourge in western Africa. The South American form is an excellent green fodder and probably owing to the volatile oil exuded by the leaf hairs, is distasteful to ticks. The African form is widely distributed on the plains and higher grounds of Portuguese Congo, taking over abandoned farm land and forming excellent pasture. Where scrub or light timber is removed it may be planted and maintained in pure stands. The possible solution of the tsetse fly problem by aid of this grass is of great importance, for if the tsetse fly can be eradicated the cattle industry will be greatly developed and the use of horses permitted in regions where now impossible. This grass has insecticidal and preventative properties, as the viscid drops of oil exuded by the hairs on the leaf sheaths have a strong odor repellant to the tsetse fly and also act as a "fly-catcher." *Melinis effusa* Stapf, growing in Angola and the lower Congo region, and *Melinis tenuinervis* Stapf, extending from southern Angola through southern Congo (Katanga) and Rhodesia to Natal and Nyasaland, have properties similar to *Melinis minutiflora* but in a lesser degree. The meat and milk of cattle fed with efwatakala grass have no taint of the characteristic odor of the grass.—T. J. Fitzpatrick.

6851. ANONYMOUS. Two years of research. Pennsylvania Agric. Exp. Sta. Bull. 170. 1-32, 1922.—This is a review of the work of the Experiment Station for the biennium ending June 30, 1921. New projects, publications, and reports on current projects are given in the form of brief abstracts including the station's work in agronomy, animal husbandry, botany and plant pathology, dairy husbandry, economic entomology, experimental agricultural chemistry, forestry, and horticulture.—H. W. Thurston, Jr.

6852. ALLAN, H. H. **Experiments on the topdressing of old pastures.** Feilding Agric. Coll. [New Zealand] Bull. 2: 1-14. 1923.—The paper gives detailed results of a botanical analysis of variously treated old pastures, by the method of Raunkiaer. In one season a very marked increase of *Trifolium dubium* occurred on plots dressed with basic slag, and with Nauru phosphate.—H. H. Allan.

6853. BALÁČEK, B. **Přístředky k hubení ohnice a hořčice polní.** [Methods for eradication of field mustard.] Časové spisky čes. odboru Zemědělské rady pro Čechy. [Periodical Publ. Czech Dept. Agric. for Bohemia] 42: 1921.—This weed can be controlled by spraying with H_2SO_4 , $FeSO_4$, or cuprozatin. Discussions of the methods and of the efficiency of spraying machines are given. Successful control can be obtained by dusting with kainit and cyanide of lime, or with a mixture of both. Other methods of control are expensive.—E. Baudys.

6854. BUNTING, B. **Progress report on the Experimental Plantation, Serdang, for the quarter ending 31st December, 1923.** Malayan Agric. Jour. 12: 51-54. 1924.—Notes are given on Palmyra palm, cocoa, Pili nut, Laba root, African oil palm, Brazil nuts, bay tree, mulberry, hemp varieties, Pita fibre, pineapple, Papaya, candle nuts, lime tree, sweet potatoes, Algaroba bean, kapok, coffee, nutmegs, and cola nuts—all new economic plants recently brought into cultivation at the plantation.—R. E. Holttum.

6855. DAY, T. R. **Manual de algodão. Meio século de experiência em Texas e no Brasil.** [A manual of cotton. A half century of experiences in Texas and in Brazil.] 136 p., 8 pl. Publ. by author: Brazil, 1922.—The compiler, formerly of Henderson, Texas, is now in Brazil. The manual includes also an article by J. W. HADDON on "Some experiences in the state of Minas" and a contribution by EDWARD C. GREEN on *Gelechia Gossypiella*. The following phases of cotton are discussed: Botanical classification, history, commercial importance, American monopoly, species, fiber, implements and animals used in cultivation, soils, culture, planting, rotation of crops, seed, fertilization, chemical analyses of plant, picking, preparation for market, ginning, classifying and marketing, relative prices of grades, and buying and manufacture of cotton. The concluding chapter deals briefly with other fibers.—F. L. Lewton.

6856. GREAT BRITAIN. TREASURY, COMMITTEE ON TOBACCO GROWING. **Report of the committee appointed by the Treasury to enquire into the industry of tobacco growing in Great Britain.** 25 p. H. M. Stationery Office: London, 1923.

6857. LEDYARD, EDGAR M. **Some values of weather reports in practical agricultural work.** Bull. Amer. Meteorol. Soc. 3: 99-105. 1922.—The development of the Weather Bureau is briefly traced and its direct and important relation to agriculture is brought out.—Earl S. Johnston.

6858. MOODIE, A. W. S. **Agricultural seeds from overseas. Effect of the voyage on germination capacity.** Agric. Gaz. New South Wales 35: 59-60. 1924.—Upon a ship bound from London to Australia seed was stored for 46 days under 3 conditions of temperature. The least decrease of viability was found where storage was in the tank room with temperature about freezing. Even in the store room, at 85-121°F., no lot of seed tested less than 67% after reaching destination. The seed tested were cocksfoot (*Dactylis glomerata*), crested dogtail (*Cynosurus cristatus*), Italian rye (*Lolium italicum*), red clover (*Trifolium pratense*) perennial rye (*Lolium perenne*), and meadow fescue (*Festuca pratensis*).—L. R. Waldron..

6859. MUSSET, RENÉ. **Le blé dans le monde.** [The grains of the world.] 199 p., 3 fig Berger-Levrault: Paris, 1923.

6860. O'DWYER, MARGARET H. **A note on protein precipitation in grasses.** Proc. Linnæan Soc. New South Wales 47: 513-515. 1922.—Since it appeared from the "Methods of Analysis of the Association of Official Agricultural Chemists of America" (1921) that no special work on precipitation of the proteins in feeding stuffs had been carried out in the U. S. A., the author undertook to test grass samples with reagents discussed by Petrie (l. c. 33. p. 837). She found that higher results were given by Stützer's Reagent (copper hydroxide) than by tannin, salt solution or alcohol. Still higher results were given by using the method of Kellner and Barnstein as described by Lunge and Keane (Technical Methods of Chemical Analysis. p. 449. 1911). The latter state that they found the results of this method agreeing in general with Stützer's unless the vegetable products contained alkaloids or compounds such as amides, when a slight difference, never exceeding 0.2% additional N, might be obtained.

The methods of preparing the solutions and of carrying out the tests, and a table listing comparable results are given. It was found that Stützer's reagent precipitates some of the non-protein nitrogen. The grasses used were *Schedonorus Hookerianus* (3 samples), *Panicum prolatum* (2 samples), *Danthonia semi-annularis* (1 sample), *D. pilosa?* (1 sample), *Eragrostis leptostachya* (1 sample), and *Andropogon intermedius* (2 samples).—*Eloise Gerry.*

6861. O'DWYER, MARGARET H. Further report on the nutritive value of certain Australian grasses. Proc. Linnean Soc. New South Wales 47: 516-518. 1922.—Reference is made to the author's earlier paper [see Bot. Absts. 12, Entry 2263] in which the nutritive value of Australian grasses in their 1st stage of growth (half way between 1st growth and early flowering) was discussed. This paper adds data on the 2nd (early flowering) and 3rd (when seed is set) stages of growth. The tabulated results give the data from analyses of specimens from different locations, including total percentage of moisture, and air dry percentages of moisture, ash, crude protein, true protein, crude fiber, ether extract, pentosan, other carbohydrates, and albuminoid ratio for the following grasses: *Andropogon intermedius* R. Br., *Danthonia pilosa?* R. Br., *Eragrostis leptostachya* Steud., *Panicum prolatum* F.v.M., *P. decompositum* R. Br., *Pollina fulva* Benth. and *Schedonorus Hookerianus* Benth. A sample of *Pollina fulva* attacked by a fungus, probably a smut, was examined. The crude protein was exceptionally low and the percentages of ether extract and of pentosan were less than generally found in grasses at the same stage. The percentage of crude fiber was higher than usual. Ergot-infected *Andropogon intermedius* also showed a low percentage of protein.—*Eloise Gerry.*

6862. PEARSE, ARNO S. Cotton in north Brazil; being the report of the journey through the states of Ceará, Maranhão and Pará, together with a synopsis of the whole of Brazil's cotton potentialities. 130 pl, illus. Internat. Fed. Master Cotton Spinners' and Manufacturers' Assoc.: Manchester. 1923.

6863. SARVIS, J. T. Effects of different systems and intensities of grazing upon the native vegetation at the northern great plains field station. U. S. Dept. Agric. Bull. 1170. 1-45. 9 pl., 11 fig. 1923.—The purpose, plan and conditions of the experiment, problems involved, and a comparison of the deferred and rotation systems with the factor of seasonal distribution of precipitation are given. The quadrant plan was used for determination of the percentage of vegetation removed by cattle annually and for a detailed study of the vegetation itself with regard to relative abundance and palatability of various species of plants. Causes of deterioration and the grazing capacity of native pastures are discussed. Of more than 250 species of plants, less than 12 are of significance in grazing. The dominant species are *Bouteloua gracilis*, *Stipa comata*, *Carex filifolia*, and *C. heliophila*. Over-grazing is easily shown by *Artemisia frigida* (pasture sage). A conclusion and summary of results are appended.—*A. D. Oxley.*

6864. SHEPHERD, A. N. Farmers' experiment plots. Hay trials at Yanco, 1923. Agric. Gaz. New South Wales 35: 251-253. 1924.—These experiments with wheat and oats were carried out upon 5 private farms. Cultural details are given.—*L. R. Waldron.*

6865. SHEPHERD, A. N., AND E. S. CLAYTON. Farmers' experiment plots. Wheat and oats experiments, 1923. Agric. Gaz. New South Wales 35: 229-238. 1924.—Cooperative experiments were conducted upon 20 private farms in 2 districts. Cultural details are given for each farm. The new variety, Union (Federation × Cowra 15), yielded remarkably well, except at one point being higher than all other varieties tried. In a fallow experiment early fallowing gave best results.—*L. R. Waldron.*

6866. SIEGLINGER, JOHN B. Grain-sorghum experiments at the Woodward Field Station in Oklahoma. U. S. Dept. Agric. Bull. 1175. 1-65. 7 pl., 13 fig. 1923.—The objects were to determine the response of different varieties of grain-sorghums to various environmental conditions and their behavior under certain conditions such as time and method of seeding, crop rotation, and soil; as well as precipitation, humidity, wind, temperature and evaporation. Classification of the grain-sorghums and explanation of the method of experimentation are included. The chief varieties of the milo and kafir groups as well as of kaoliang, shallu and other minor groups were tested. Comparisons were made for yield under various conditions, especially as to time of planting and width between rows, to determine the optimum for each variety.—*A. D. Oxley.*

6867. SMITH, J. WARREN. **Agricultural meteorology.** Bull. Amer. Meteorol. Soc. 3: 88-89. 1922.—Miscellaneous notes are given.—*Earl S. Johnston.*

6868. STENING, H. G. **Wheats from South Australia.** Agric. Gaz. New South Wales 35: 254. 1924.—Notes are given on the introduction of 6 new solid-strawed hybrid wheats developed to replace bearded by beardless varieties. Experiments indicate that loss of beard has not reduced yield.—*L. R. Waldron.*

6869. STEPHENS, DAVID E. **Experiments in wheat production on the dry lands of the western United States.** U. S. Dept. Agric. Bull. 1173. 1-50. 24 fig. 1923.—The importance of wheat farming in some of the Western States, types of soil and climate best suited for dry-land wheat production, and treatment of land by discing, harrowing, plowing, and burning of stubble, with the effect on production are discussed. Plans and results of experiments at Moro, Oregon; Nephi, Utah; and Lind, Washington, are presented, with particular consideration of the effects of fallowing, precipitation, rate and date of seeding and depth of planting, on yield and quality of winter and spring wheats.—*A. D. Oxley.*

6870. STOA, T. E., AND A. C. DILLMAN. **Flaxseed production.** North Dakota Agric. Exp. Sta. Bull. 178. 43 p., 11 fig. 1924.—North Dakota grows approximately $\frac{1}{2}$ of the flaxseed produced in the U. S. A. The 2 main limiting factors in its production in North Dakota are weeds and wilt (*Fusarium lini*). Attempts are being made to produce a high yielding, disease resistant flax variety to supplant the resistant but low yielding number 114 variety. Dockage in flaxseed runs from 8 to 37%. In eastern North Dakota best yields are secured by seeding 2 pecks per acre. A lower rate, down to 20 pounds, is sufficient in the western portion of the state. Early seeding is recommended except where early germinating weeds, such as Russian thistle, are a menace. Decision as to the advisability of growing flax-wheat mixtures is held in abeyance until the results of future trials are secured. Some damage is done by flax canker (*Colletotrichum lini*) and rust (*Melampsora lini*). The Argentine disease, pasmo (*Phlyctaena linicola*), is still new in North Dakota.—*L. R. Waldron.*

6871. TANKERSLEY, N. S. **Report on mangold experiments—season 1922-23.** Feilding Agric. Coll. [New Zealand] Bull. 1. 3-5. 1923.—It is concluded that phosphatic fertilizing is essential for successful cropping and that potash does not pay in the locality under test. The experiments are being repeated.—*H. H. Allan.*

6872. U. S. DEPARTMENT OF AGRICULTURE. BUREAU OF AGRICULTURAL ECONOMICS. **Seed statistics, year ending May 31, 1923.** With considerable data for earlier years. Statistical Bull. 2. 1-100. 1924.

6873. U. S. DEPARTMENT OF AGRICULTURE. BUREAU OF AGRICULTURAL ECONOMICS. **The United States cotton standards act and the universal standards.** Service and Regulatory Announcements 82. 28 p. Government Printing Office: Washington, 1924.

6874. WATTS, R. L. **Annual report of the director.** Pennsylvania Agric. Exp. Sta. Bull. 176. 1-22. 1922.—This report is for the year ending June 30, 1922. A review of the Experiment Station work is given in the form of brief reports or abstracts of the various projects including agronomy, animal husbandry, botany and plant pathology, dairy husbandry, economic entomology, experimental agricultural chemistry, and horticulture.—*H. W. Thurston, Jr.*

6875. WATTS, R. L. **36th annual report of the director.** Pennsylvania Agric. Exp. Sta. Bull. 181. 1-28. 1923.—This report is for the year ending June 30, 1923. Brief abstracts of the various research and experimental projects of the Experiment Station are given, including agronomy, botany and plant pathology, entomology, chemical agriculture, dairy husbandry, forestry, horticulture, poultry husbandry, and animal nutrition.—*H. W. Thurston, Jr.*

6876. WENHOLZ, H. **Field maize competition.** The Inverall Pastoral and Agricultural Society. Agric. Gaz. New South Wales 35: 239-250. 1924.—A new type of field maize competition was inaugurated at Inverall, similar to the field wheat competitions held in N. S. W. Ten acres of maize selected from a larger field were entered and judged according to general condition and appearance, cleanness of cultivation, freedom from disease and insect pests, purity of seed and trueness to type, and apparent yield. This method is said to give those having less fertile soil, conditions comparable to those having fertile soil. Modifications are suggested for future competitions.—*L. R. Waldron.*

6877. WHITTET, J. N. Apasture improvement competition. *Agric. Gaz. New South Wales* 35: 272. 1924.—During a very dry season introduced grasses showed to better advantage than most of the native pasturage.—*L. R. Waldron.*

6878. YEAGER, A. F. Popcorn pointers. *North Dakota Agric. Exp. Sta. Circ.* 24. 8 p. 3 fig. 1924.—The varieties Golden Tom Thumb, Black Beauty, Iroquois, Japanese Hulless, and Black Diamond are sufficiently early to be safe for the region of Fargo. Of these, only Black Beauty and Japanese Hulless are considered of good popping quality. For 3 years Black Beauty and Japanese Hulless yielded, respectively, 2600 and 2070 pounds of ears per acre. Optimum moisture content for popping lies between 11 and 13.5%. When popcorn is too dry for popping, quality may be restored by exposing to normally moist air for 2 weeks.—*L. R. Waldron.*

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(See also in this issue Entries 7175, 7312, 7328)

6879. ANONYMOUS. Bohumil Němec. *Preslia* 2: 5-12. *Portrait.* 1922 [1923]. This biography of Bohumil Nemeč contains a bibliography of his writings, 1895-1923.—*C. W. Dodge.*

6880. ANONYMOUS. Field meeting of the Josselyn Botanical Society of Maine. *Maine Nat.* 2: 146-147. 1922.—A brief account of the 1922 field meeting at Eastbrook is given.—*C. A. Weatherby.*

6881. ANONYMOUS: Josselyn Botanical Society of Maine. *Maine Nat.* 1: 73. 1921.—A brief account of the field meeting at Brunswick, July 12-15, 1921, is given.—*C. A. Weatherby.*

6882. ANONYMOUS. List of botanical papers by the late Mr. J. R. Drummond. *Kew Bull.* 1922: 301, 302. 1922.—Fifteen papers and the 8-volume transcript of Duthrie's field books of northern India are noted.—*T. J. Fitzpatrick.*

6883. ANONYMOUS. List of publications by the late G. Masee. *Kew Bull.* 1922: 335-348. 1922.—Two hundred and eighty nine titles are given, covering a wide range of subjects, mostly mycological, and extending over the period, 1867-1916.—*T. J. Fitzpatrick.*

6884. ANONYMOUS. Prof. Jacques Loeb. *Nature* 113: 574-576. 1924.

6885. ANONYMOUS. The botanical magazine. *Kew Bull.* 1922: 349, 350. 1922.—This is a short article concerning the resumption of publication of Curtis's Botanical Magazine under the auspices of the Royal Horticultural Society, after a lapse of nearly two years. The new editor is Dr. O. Stapf; the current volume, 148. A volume for 1921 to cover the period of suspension is being prepared by private enterprise.—*T. J. Fitzpatrick.*

6886. BALSS, HEINRICH. Praeformation und Epigenese in der griechischen Philosophie. [Preformation and epigenesis in Greek philosophy.] *Arch. Storia Sci.* 4: 319-325. 1923 [1924].

6887. BOHN, G. Le Mouvement biologique en Europe. 144 p. A. Colin: Paris, 1921.

6888. B[ULLER], A. H. R. [Rev. of: MACOUN, JOHN. *Autobiography of John Macoun, M. A., Canadian Explorer and Naturalist, Assistant Director and Naturalist to the Geological Survey of Canada, 1831-1920.* x + 305 p., 8 pl. *Field Naturalists' Club: Ottawa*, 1922, [See *Bot. Absts.* 12, Entry 3765.] *Canadian Field Nat.* 37: 119-120. 1923.

6889. Федченко, Б. А. [FEDCHENKO, B. A.] editor. Ботаническое Обозрение реФерующий орган главного ботанического сада в Петрограде. [Botanical Reviews, abstracting organ of the chief botanical garden of Petrograd.] *Bot. Rev. Chief Bot. Gard. Petrograd* 1: 1. 1922.—This note announces the publication of a new Russian abstracting journal. The abstracts are published in Russian, but the titles are translated into French, German or Latin.—*C. W. Dodge.*

6890. FLAHAULT, CH. Gustave Thuret-Edouard Bornet. *Rev. Algologique* 1: 4-25. *Portraits.* 1924.—This biographical sketch is illustrated with anecdotes and reminiscences. A bibliography containing 22 titles by Thuret and 58 titles by Bornet concludes the article.—*C. W. Dodge.*

6891. FRANCHINI, ADELE. *Giovanni Chiarini e la spedizione ai laghi equatoriali.* [Giovanni Chiarini and the expedition to the equatorial lakes.] 80 p., 6 pl., 1 map. Libreria di Scienze e Lettere: Roma, 1923.

6892. GYÖRFFY, I. Bevezető—Vorwort. [Prefatory Remarks.] *Folia Crypt.* 1: 1-2 1924.—The author states, in both Hungarian and German, his reasons for the founding of a periodical devoted to articles on Hungarian cryptogamic botany.—*E. B. Chamberlain.*

6893. GYÖRFFY, I.] *Szomorító hírek-Fama lugubris.* *Folia Crypt.* 1: 43-44. 1924.—The author announces the death on February 28, 1924, of the plant pathologist, K. Posch, at Budapest.—*A. W. Evans.*

6894. HERTEL, H. *Direktor Frederick Moller.* *Tidsskr. Landokonomi* 12: 581-584. 1923.—School Director Frederick Moller was a strong factor in Danish agriculture. He lectured in all parts of Denmark and was particularly interested in poultry exports. He was born on April 20, 1854, and died October 22, 1923.—*Albert A. Hansen.*

6895. HERTEL, H. S. C. A. Tuxen. *Tidsskr. Landokonomi* 2: 91-94. 1924.—S. C. A. Tuxen was born in Copenhagen, Denmark, May 14, 1848. In 1869 he was graduated from the Agricultural High School and until 1874 engaged in farming. He was editor of a weekly farm journal (1874-1879) and professor at the Classenske Agricultural High School (1879-1902). Then elected president of that institution, he occupied this position until 1916 when he resigned to go to the West Indies. In 1922 he returned to Denmark and died January 18, 1924, in the province of Slesvig.—*Albert A. Hansen.*

6896. HOLLAND, J. H. *The royal botanic gardens, Trinidad.* *Kew Bull.* 1922: 223, 224. 1922.—The garden was founded in 1818 and has had unbroken continuity. It has been the means of introducing and distributing many of the plants which were conducive to the welfare of the colony and others which are of value for the sake of their flowers and fruits.—*T. J. Fitzpatrick.*

6897. HOWARD, G. *In memoriam. Harry Moore, F. R. M. S.* *Naturalist* 1924: 114. 1924. Moore was a good botanist, native of Rotherham (1845-1924).—*W. H. Burrell.*

6898. JOHNSON, D. S. William Harris. *Bot. Gaz.* 71: 331-333. *Portrait.* 1921.—William Harris, born in Enniskillen on Lough Erie, County Fermanagh, Ireland, in 1860, died at Kansas City, Missouri, in 1920. He was educated at Kew and spent most of his life in the Botanical Department of Jamaica. He was instrumental in building up a large herbarium at the Hope Gardens.—*C. W. Dodge.*

6899. КОМАРОВ, В. Л. [КОМАРОВ, V. L.] *Ботанические маршруты важнейших русских экспедиций в Центральную Азию; I. Маршруты Н. М. Пржевальского.* [Botanical itineraries of the principal Russian expeditions into Central Asia. I. Itineraries of N. M. Prezevalski.] *Труды Главного Ботанического Сада* [Trans. Chief Bot. Gard. Petrograd] 34: 192. 1920.

6900. КОМАРОВ, В. Л. [КОМАРОВ, V. L.] *Краткий путеводитель по Ботаническому Саду.* [Small guide to the botanical garden, Petrograd.] 100 p., 8 maps. Петербург [Petrograd], 1919.

6901. MANGIN, L. [Preface.] *Rev. Algologique* 1: 1-3. 1924.—This article announces the new quarterly journal, *Revue Algologique*, covering the whole field of algology, including physiology and studies of fungus parasites of algae. It is to be edited by P. Allorge and G. Hamel.—*C. W. Dodge.*

6902. MAXON, WILLIAM R. *The botanical gardens of Jamaica.* *Ann. Rept. Smithsonian Inst.* 1920: 523-535. *Pl. 1-20.* 1922.—The first botanical garden was established nearly 150 years ago by Hinton East, near the present village of Gordontown. In 1775 the island government established a botanical garden at Enfield adjoining East's garden, and placed it under the charge of Dr. Thomas Clarke. The camphor tree, Chinese tea plant, litchi, sago "palm," clove tree and the akee were introduced. The akee now common in many parts of the island is a tree prized both for ornament and food. In 1779 a second garden was established near Bath, 44 miles east of Kingston, and placed under Clarke. Foreign plants were rapidly introduced. One lot from Mauritius was part of the cargo of a ship captured from the French. These, planted in East's garden, included cinnamon, jackfruit and mangoes. The government purchased East's garden in 1790, and sold it again to private owners in 1810. The better known directors of Bath Garden are MacFadyen, who studied the native flora; Wilson, who

established an extensive collection of fiber-producing plants and introduced the durian and mangosteen, *Bougainvillea*, the flamboyant tree, and *Amherstia nobilis*. Bath Garden was subject to frequent inundation by Sulphur River. In 1860 a new garden was founded at Castleton and Bath Garden suffered neglect. At present it covers but little more than an acre of ground where there is a small arboretum and a nursery for Cacao.—Castleton Gardens under Wilson's direction progressed steadily. They cover about 30 acres in a secluded valley about 580 feet above sea level with an annual rainfall of 120 inches. They now contain a wonderful collection of plants, especially trees, from all parts of the tropics, the palm collection with nearly 200 species being especially striking. The planting has been so harmoniously done that the garden is in perfect keeping with its surroundings.—In 1868 about 600 acres between 4000 and 6000 feet altitude in the Blue Mountains was acquired, primarily for the production of Peruvian bark or cinchona. The trees thrived and additional land was secured, but the competition of the East Indies prevented the development of the quinine industry that had been projected. European vegetables were introduced and thrived at this altitude. After the development of Hope Gardens, Cinchona (the Hill Gardens) was gradually abandoned. In 1903 the buildings and about 10 acres of land were rented to the New York Botanical Garden which established a botanical laboratory and conducted it for 10 years. For 1 year it was leased to the British Association for Advancement of Science and for 3 years to the Smithsonian Institution. For the last few years no active work has been carried on there.—In 1873 a nursery and experient station was established by the Government on some 200 acres adjacent to Hope Reservoirs, the beginning of Hope Gardens. This afforded a drier climate than either of the other 2 gardens. Work on sugar-cane was transferred to Hope, and gradually also the more purely agricultural lines of work. The Gardens were developed by Fawcett and the late William Harris. Experimental work on tropical plants is the leading feature, experimental grounds and nurseries which annually supply thousands of young plants to the islanders occupying the greater part of the grounds. They are beautifully laid out and serve as a pleasure garden, with extensive ferneries and a large collection of epiphytic orchids. There is a herbarium representing the native flora of Jamaica, and a library. Visiting botanists are afforded facilities for work.—Besides those mentioned are 2 smaller gardens, one Victoria Park in Kingston, consisting of 7 acres, and the other King's House garden of 177 acres surrounding the residence of the governor northeast of Kingston.—A. Chase.

6903. MORRIS, FRANK. W. H. Hudson, the naturalist (1841-1922). Canadian Field Nat. 38: 24-26, 51-54. 1924.—W. H. Hudson was born on the Pampas of La Plata, Argentine, the son of an Englishman. Most of his life was spent in field studies. The 1st publications of his observations from nature appeared in 3 well-known books: Birds of La Plata, The Naturalist in La Plata, and Idle Days in Patagonia.—W. H. Emig.

6904. NEWCOMBE, F. C. Wilhelm Pfeffer. Bot. Gaz. 71: 152-154. Portrait. 1921.—After a brief summary of Pfeffer's career, the author gives interesting reminiscences.—C. W. Dodge.

6905. Новопокровский, И. В. [NOVOPROKOVSKI, I. V.] Проф. А. О. Флеров. К 25-лѣтнему юбилею его научной дѣятельности. [Prof. A. Th. Flerov, on the 25th jubilee of his scientific activity.] Журнал Новочеркасскаго Отдѣленія Русскаго Ботаническаго Общества. [Jour. Novocherkassk Sect., Russian Bot. Soc.] 1: 48-63. 1919.

6906. PANINI, FRANCESCO. Intorno ad un erbario di Gio. Batt. Casapini esistente in Modena. [The herbarium of G. B. Casapini at Modena.] Arch. Storia Sci. 5: 41-48. 1924.—Besides giving a detailed description of the Casapini collection, the author adds more than 2 pages of titles of articles relating to early European herbaria.—C. W. Dodge.

6907. PEARSALL, W. H. Botany at the British Association. Naturalist 1923: 374. 1923.—

6908. SABBATINI, LUIGI. Di una supposta opera di Luca Ghini. [A spurious work of Luca Ghini.] Arch. Storia Sci. 5: 37-40. 1924.

6909. SEWARD, A. C. Alfred Gabriel Nathorst. Bot. Gaz. 71: 462-465. Portrait. 1921.—Nathorst (1850-1921) was for many years director of the Paleobotanical Museum of the Swedish Academy, and well known for researches in the paleobotany, geology and geography of Arctic regions.—C. W. Dodge.

6910. Смирнов, В., и Н. Умнов. [SMIRNOV, V., AND N. UMOV.] Материалы по библиографии Костромского края. 4. Ботаника. [Bibliographical materials of Kostrom.

4. Botany.] Труды Костромского Научного Общества [Contrib. Kostrom Sci. Soc.] 14: 37-43. 1919.

6911. STRÖM, K. MÜNSTER. Professor N. Wille. Rev. Algologique 1: 24-27. *Portrait*. 1924.—This brief biographical sketch is accompanied by a bibliography of 70 titles.—C. W. Dodge.

6912. TESSENOW, M. Andreas Voss. Möllers Deutsch. Gärtnerzeitg 29:100. 1924.—Andreas Voss was born at Lyke near Bremen in 1857 and died in Heiligendamm in 1924. He was a prominent German horticulturist, the writer of several works. He edited "Vilmorins Blumengärtnerei" adapting it to German conditions.—J. C. Th. Uphof.

BOTANICAL EDUCATION

C. STUART GAGER, *Editor*

ARTHUR H. GRAVES, *Assistant Editor*

(See also in this issue Entry 6992, 7061)

6913. ANONYMOUS. List of staffs of the Royal Botanic Gardens, Kew, and of botanical departments, establishments and officers at home, and in the dominions, India and the colonies, in correspondence with Kew. Kew Bull. 1922: appendix II, 1-44. 1922.—This annual, official register indicates to some extent the lines of activity in the various establishments.—T. J. Fitzpatrick.

6914. ANONYMOUS. New agricultural building at the University of Leeds. Nature 113: 551-552. 1924.

6915. ANONYMOUS. The Imperial College of Tropical Agriculture. Nature 113: 370. 1924.—The laying of the foundation stone of this institution in Trinidad is noted; also a brief description of the location and work of the college.—O. A. Stevens.

6916. ANONYMOUS. The university botanic garden, Cambridge. Kew Bull. 1922: 304. 1922.—This is a short note on the recently published guide to the garden, by H. Gilbert-Carter, director.—T. J. Fitzpatrick.

6917. ANONYMOUS. Universities of the empire. [Rev. of: DAWSON, W. H. (ed.) The year book of the universities of the empire, xii + 756 p. (Published for the Universities Bureau of the British Empire.) G. Bell and Sons: London, 1924.] Nature 113: 597-598. 1924.

6918. BUTTRICK, P. L. Connecticut's state flower, the mountain laurel, a forest plant. Marsh Bot. Garden Publ. 1: 1-28. *illus*. 1924.—In this pamphlet are discussed the history of mountain laurel, its systematic relationships, methods and rate of growth, relation to forestry, laws regulating collection, use for decorative purposes and growth for the market. The policy which landowners and the public should adopt with regard to mountain laurel is outlined, the general point of view being along the line of conservation.—A. H. Graves.

6919. H., J. S. The teaching of general biology. [Rev. of: BURLINGAME, LEONAS LANCELOT, HAROLD HEATH, ERNEST GALE MARTIN, AND GEORGE JAMES PEIRCE. General biology. xxix + 568 p. H. Holt & Co.: New York, 1923.] Nature 113: 301-302. 1924.—In England, biology is a subject for specialists; in America, it is a part of the general education. The English system could well be modified to give such study more attention.—O. A. Stevens.

6920. IKENO, SEI ITIRO. Syokubutu-Keitogogaku. [Phylogenetic botany.] Written in Nipponese and not translated. Maruzen Co.: Tokyo, 1921.

6921. JEPSON, W. L. A flora of the economic plants of California, for agricultural students, including the important crop plants, agricultural weeds, poisonous plants, honey plants, medicinal plants, chaparral shrubs, native timber trees, and the most common native plants of the spring flowering. 223 p. *illus*. Assoc. Students Store: Berkeley, Cal., 1924.

6922. RIGG, GEORGE B. The pharmacists' botany. XVII + 303 p. 45 fig. MacMillan Co.: New York, 1924.—In this text, designed for the use of students of pharmacy, particular emphasis is laid throughout on those parts of plants and those species which possess pharmaceutical value. Part I deals with seed plants; part II, spore plants, i.e., thallophytes, bryophytes, and pteridophytes; and part III, ecology, propagation and plant breeding. An appen-

dix contains a synopsis of the plant kingdom and a list of the scientific names of plants mentioned in the text.—A. H. Graves.

6923. SCHNEIDER, A. **Pharmaceutical bacteriology.** 2nd ed. 441 p. 97 fig. P. Blakiston's Son & Co.: Philadelphia, 1920.—After 5 chapters on the history, origin, morphology, physiology, distribution, etc., of bacteria, and on bacteriological technique, a chapter is devoted to symbiology, or the phenomena of symbiosis. Bacteria in the industries, ferments and fermentation, immunology, serology, adenology, yeasts and molds, protozoa in disease, disinfectants and disinfection, food preservatives, communicable diseases, and directions for a bacteriological laboratory for the pharmacist are some of the subjects considered in succeeding chapters. In this edition, the chapters on the origin of bacteria, symbiology, zymology, and adenology have been added.—A. H. Graves.

6924. SHIPLEY, A. E. **Life, a book for elementary students.** 204 p. 70 fig. MacMillan Co.: New York, 1923.—This book, written in popular style, deals with the life of plants and animals. After an introduction, the following subjects are discussed: protoplasm, cells, feeding, chlorophyll and the carbon cycle, the nitrogen cycle, the soil and the sap, food, digestion, respiration, movement, rhythm, and reproduction. The book is intended for elementary students of biology and emphasizes the essential unity of the living world.—A. H. Graves.

6925. SMITH, W. G. **Presidential address—Agricultural botany.** Trans. & Proc. Bot. Soc. Edinburgh 28: 77–84. 1922.—In a survey of the things that have helped to establish what is called agricultural botany, a general historical sketch is given of crop plants, nutrition of plants, soil biology, plant breeding and pathology. The progress of applied botany is said to depend on utilization of the latest researches in botany, and conversely the stimulus to further investigation in botany may come from the problems incidental to agriculture, forestry and horticulture.—L. R. Abrams.

6926. TRUE, A. C. **Opportunities for the agricultural college graduate in experiment station work.** Illinois Agriculturist 28: 261–262. 1924.

6927. UNDERHILL, O. E. **Two sunshine chemists, Chloro and Phyll.** Gen. Sci. Quart. 8: 556–562. 1924.—The principles of photosynthesis and the importance of this process in energy storage are illustrated in the form of a dialogue between teacher and pupils.—L. A. Kenoyer.

6928. WOODRUFF, L. L. **Foundations of biology.** 476 p., 211 fig. MacMillan Co.: New York, 1922.—The underlying principles of biology are set forth in this book which is planned as a companion text to a college laboratory course in general biology. The chapters are as follows: the scope of biology; the physical basis of life; organizational units of plants and animals; a chapter each on the metabolism of green plants, of animals, and of colorless plants; the multicellular organism; the plant body; reproduction in plants; the animal body; chapters on circulation and respiration, excretion, coördination and reproduction in animals; origin of the individual, heritage of the individual, adaptation of organisms; the origin of species, and epochs in biological history. In an appendix are given outlines of classification of the plant and animal kingdoms, a list of important books for collateral reading, and a glossary.—A. H. Graves.

CYTOLOGY

GILBERT M. SMITH, *Editor*

(See also in this issue Entries 7034, 7052, 7180, 7245, 7339)

6929. LEVADITI, C., S. NICOLAU, ET R. SCHOEN. **Nouvelles recherches sur l'Encephalitozoon cuniculi.** [New researches on *E. cuniculi*.] Compt. Rend. Soc. Biol. 90: 662–666. 3 fig. 1924.

6930. NEWTON, W. C. F. **Studies on somatic chromosomes. 1. Pairing and segmentation in Galtonia.** Ann. Bot. 38: 197–206. Pl. 9, 3 fig. 1924.—The nuclei of both *G. candicans* and *G. princeps* show 8 pairs of chromosomes divisible according to length into 3 groups. All chromosomes exhibit a subterminal constriction at the point of attachment of the spindle fiber. This constriction divides the chromosome into a short proximal and a relatively long distal segment and in some cases there is a considerable degree of separation of the segments.

Pairing of chromosomes is quite evident during anaphase and persists throughout telophase and prophase but is much interrupted at metaphase. The members of each pair lie close together and parallel. The pairing is easily distinguished from the doubleness produced by the longitudinal split.—*W. P. Thompson.*

6931. SARBADHIKARI, P. C. *Cytology of Osmunda and Doodia*. 1. On the somatic and meiotic mitoses of *Doodia*. *Ann. Bot.* 38: 1-27. Pl. 1-4. 1924.—In somatic divisions the telophasic alveolization resolves the chromosomes, in an almost diagrammatic manner, into 2 parallel filaments. The fission persists in succeeding stages and the chromosomes at the next division are formed by the side to side approximation of the parallel halves which had originated at telophase.—The meiotic divisions are found to be in substantial agreement with Miss Digby's account of events in *Osmunda*, and the telosynaptic view is supported. The resemblance between presynaptic stages and the telophasic stages of somatic mitoses is strongly emphasized. Univalent chromosomes result from the close approximation of 2 similar threads (separated halves). These become concentrated but the fission is not closed up though it becomes indistinct in later stages. Bivalent chromosomes are formed at the 2nd contraction by the close conjunction of 2 univalents which bend over to form loops. The double nature of each univalent persists and some of the bivalent segments show both fission and conjunction.—*W. P. Thompson.*

6932. TAYLOR, WM. RANDOLPH. *Cytological studies in Gasteria I. Chromosome shape and individuality*. *Amer. Jour. Botany* 11: 51-59. 26 fig. 1924.—Among the 7 pairs of chromosomes which occur in *Gasteria* there are several distinct differences in size and in configuration; 3 of the pairs are small and essentially similar, 4 are much larger. All the chromosomes tend to display one or more constrictions which seem to be associated with the point of attachment of the spindle fiber, although they make their appearance in the prophase, long before fiber-attachment has taken place. In 3 of the large chromosome pairs, the constriction is close to one end. The 4th pair, however, is clearly distinguishable from the others in having its constriction considerably farther from the end. The 2nd maturation division of the microsporecyte was found to be the most favorable for study.—*E. W. Sinnott.*

ECOLOGY AND PLANT GEOGRAPHY

GEO. D. FULLER, *Editor*

(See also in this issue Entries 6857, 6863, 6922, 6996, 7006, 7009, 7011, 7014, 7018, 7020, 7151, 7160, 7169, 7177, 7179, 7182, 7184, 7185, 7186, 7188, 7190, 7191, 7194, 7195, 7196, 7197, 7198, 7199, 7206, 7207, 7255, 7382, 7396, 7399, 7427, 7429, 7439, 7458, 7461, 7468, 7472, 7473, 7474, 7476, 7481, 7487, 7488, 7489)

STRUCTURE, BEHAVIOR, SYMBIOSIS.

6933. CAMMERLOHER, HERMANN. *Blütenbiologische Beobachtungen an Loranthus europaeus* Jacq. [Flower pollination in *Loranthus europaeus*.] *Ber. Deutsch. Bot. Ges.* 39: 64-70. 3 fig. 1921.—Tropical species of *Loranthus* have been reported as adapted to pollination by birds. The only reference touching *L. europaeus* is a statement by Engler (*Nat. Pfl.* 3: 173) that pollination of many imperfect flowered species of *Loranthus* evidently is brought about by the wind and that little is known regarding nectaries in the genus. The writer studied the flowers on a number of bushes growing on 2 young oaks in the botanical garden (University of Innsbruck?). Many flowers were produced at the end of May and the 1st of June, 1920. The flower is described. Wind pollination is not indicated, since the pollen grains are waxy and cling together on the open anthers. The color of the flowers is yellowish green, somewhat like that of *Bryonia* and they are not conspicuous; no odor was detected. Abundant nectar was found in the flowers especially in the morning. It is accessible to insects with very short tongues. From May 26 to June 10 many insect visitors were noted: various flies, an ant (*Aphaenogaster* sp.), and 2 bees (*Halictus* sp., *Colletes* sp.). *Halictus* was regarded as the chief pollinator. Foreign pollen resembling the malvaceous type was found on the stigmas in 2 cases.—*O. A. Stevens.*

6934. CHIPP, T. F. **Butresses as an assistance to identification.** Kew Bull. 1922: 265-267. 6 fig. 1922.—The majority of trees which become dominant in a tropical rain forest develop butresses. These butresses vary in shape, size, and method of development, but certain styles characterized particular trees. Observations were made in the West African rain forests and the following results were obtained: Group I, trees with stilt-roots or butresses arising in the upper angle of sub-aerial roots, developing imperfectly or rarely perfectly formed plank butresses as in *Rhizophora*, *Avicennia*, *Ficus*, *Musanga Smithii*, and *Tarrietia utilis*. Group II, trees possessing perfectly formed plank butresses which arise in the angle of the stem, and lateral surface roots, as in *Eriodendron*, *Bombax*, *Piptadenia*, *Parkia*, *Entandrophragma*, *Lophira*, *Terminalia*, *Anopyxis*, *Khaya*, *Triplochitan* and *Cynometra*. Group III, trees with stems deeply furrowed or fluted towards the base but not possessing any real butresses, as in *Alstonia congensis*, *Chlorophora excelsa*, and *Cylicodiscus gabunensis*.—Group IV, trees with cylindrical trunks to the base as in *Mimusops*.—These observations give clues to the identification of trees in the forest where only the bases can be seen and the crowns are hidden in the tangled canopy above.—T. J. Fitzpatrick.

6935. FULLER, GEO. D. **Mycorrhiza of forest trees.** [Rev. of (1) McDougall, W. B. *On the mycorrhizas of forest trees.* Amer. Jour. Bot. 1: 51-74. 4 pl. 1 fig. 1914. (2) MELIN ELIAS. *On the mycorrhizas of Pinus silvestris L. and Picea Abies Karst.* A preliminary note. Jour. Ecology 9: 254-257. 1922 (see Bot. Absts. 11, Entry 2722). (3) RAYNER, M. C. *Obligate symbiosis in Calluna vulgaris.* Ann. Bot. 29: 97-153. 1915.] Bot. Gaz. 73: 506. 1922.

6936. FULLER, GEO. D. **Plagiotropic shore plants.** [Rev. of: TURESSON, GÖTE. *The cause of plagiotropy in maritime shore plants.* Lunds Univ. Arsskrift N. F. Avd. 2. 16: 1-32. 2 pl. 1919. [see this issue, Entry 6941.] Bot. Gaz. 72: 112. 1921.

6937. MACDOUGAL, D. T. **The reaction of plants to new habitats.** Ecology 2: 1-20. 1 pl., 3 fig. 1921.—Stations for experimentation in the introduction of plants not indigenous to the localities were selected in 4 places differing widely in rain-fall, temperature, soil and altitude, as well as in length of the growing season. These stations were at the 2500 m. elevation in the coniferous forest of the Santa Catalina Mountains of southern Arizona, at 1700 m. in the same mountains, at the Desert Laboratory, and at the Coastal Laboratory in the summer-fog region of California. Plants of 139 species were used and with introductions and re-plantings the total number of operations was 250. The plants were mainly transferred from one station to another but some were brought from the eastern U. S. A. and Mexico. Observations extend from 1906 to 1920. The montane plantation showed the establishment and survival of 7 out of 28 species, the xeromontane 7 out of 33, Desert Laboratory 6 out of 21, and the Coastal Laboratory 41 out of 100. A consideration of survival in relation to the various propagules used in the 139 species shows the following percentages of survival; aerial resting shoots 38%, seeds 30%, rhizomes and roots 26%, and corms and bulbs only 10%. The low percentage in the last was due to the depletion of food in the storage organs. Plants brought from the montane region to the coast had a survival of 15 out of 18 species. Of 56 transferred from the arid stations to the coast only 14 survived and of these 9 were cacti. No species brought from the Atlantic or Pacific coast regions survived at the Desert Laboratory and none from the coasts, Desert Laboratory or xeromontane stations at the montane station. The plants which survived transfer showed in some cases teratological variations as supernumerary leaflets, aecidial leaves, peloric flowers, etc. Animals, especially rodents which eat the plants, act as a barrier to the upward extension of the altitude range of certain species of *Opuntia*. Dissemination of plants is freer when they are transferred from regions of climatic extremes to more equable climates. The habitat of a plant is not always the most favorable one for its development and dissemination as is evidenced by the development of weeds.—H. H. M. Bowman.

6938. MELIN, ELIAS. **Experimentelle Untersuchungen über die Birken- und Espenmykorrhizen und ihre Pilzsymbionten.** [Investigations on the birch- and aspen mycorrhizas.] Svensk Bot. Tidskr. 17: 478-520. Fig. 1-16. 1923.—The natural mycorrhizas of *Betula pendula* Roth, *B. alba* Roth and *Populus tremula* L. were investigated. The mycorrhizas are of the ectendotrophic type and have the same structure in all 3 species. There is an outer layer of hyphae (Hyphenmantel) built up by large parenchymatous cells, a medium layer (Palisadenschicht) of long, tubular, oblique cells and an inner, digesting layer (Ver-

daungungsschicht) of isodiametric cells. In the palisade layer intracellular infection takes place. There are 2 kinds of hyphae: thick albumenous hyphae that grow from the outer straight layer through the palisade into the digesting layer, and very thin haustorial hyphae with a tortuouse growth. The latter are partly fragmented and destroyed in the palisade cells and partly continuous into the digesting layer. In the latter an abundant intracellular infection takes place by both kinds of hyphae. No hyphae are found in the endodermis and central cylinder. The albumenous hyphae are doubtless digested by the root-cells, while the fungus is nourished by means of the haustorial hyphae. Besides the ectendotrophic mycorrhizas, pseudo-mycorrhizas are found as in pine and spruce. The culture of the fungi, the germination of the seeds, and the synthesis of the mycorrhizas were performed as in previous cultures. *Boletus rufus* Schaeff. grows very poorly on agar and gelatine and does not form colonies, but, inoculated on birch and aspen plants, it gives rise to mycorrhizas. *Boletus scaber* Bull. grows slowly on agar and gelatine but, inoculated on sterile birch and aspen plants, it grows much better and gives rise to mycorrhizas of the same structure as the natural one, as well as to pseudo-mycorrhizas. *Tricholoma flavobrunnea* Fr. grows well on culture media and gives rise to mycorrhizas and pseudo-mycorrhizas on birch. *Amanita muscaria* L. is very difficult to grow on culture media but gives rise to mycorrhizas on birch plants. Inoculations with *A. rubescens* Fr., again gave no result. *Boletus luteus* L. gave no mycorrhizas on birch and aspen; and *B. hadius* Fr. and *B. edulis* Bull., no mycorrhiza on birch, though the latter probably is capable of mycorrhizal formation when growing under more favorable conditions. *M. R. silvestris* β and γ were isolated by the author from pine mycorrhizas. The latter gave ectendotrophic mycorrhizas and pseudo-mycorrhizas on birch while the former gave only pseudo-mycorrhizas. Several species of *Tricholoma*, *Amanita*, *Russula*, *Lactarius* and *Cortinarius* are suggested as probable mycorrhiza-formers in birch and aspen forests. The experimentally induced mycorrhizas are of the same structure as the natural ones. In the typical ectendotrophic mycorrhizas on birch and aspen, root and fungus live in symbiosis, as it may be shown by anatomical investigation that the root is not injured by the fungus. The latter is, moreover, partly resorbed and grows much better on the young plants than on culture media.—O. Heilborn.

6939. SAFFORD, W. E. Ant. Acacias and Acacia ants of Mexico and Central America. Ann. Rept. Smithsonian Inst. 1921: 381-394. Pl. 1-15. 1923.—A number of Acacias are provided with large thorns which are utilized by distinct species of ants as homes, excavating them when the thorns are young and comparatively soft. Petiolar glands furnish a nectar, and the tips of leaflets waxy bodies both of which are food for the ants. The ants are fierce and, in many cases, protect the plants from disturbances by other animals. Francisco Hernandez was the first to report on these relations in 1651. Francis Darwin made a study of the nectar glands and food bodies. The various species of ant Acacias have been grouped according to the form and structure of their fruit. The habits of the ants inhabiting the Acacias have been closely studied.—Neil Hotchkiss.

6940. SHAFTESBURY, A. D. Pollination and honey bees. Rept. Maryland Agric. Soc. 7: 313-322. 1922 (1923).

6941. TURESSON, GÖTE. The cause of plagiotropy in maritime shore plants. Lunds Univ. Årsskrift. N. F. Avd. 2. 16²: 1-32. 2 pl. 1919.—From the results of experiments carried on largely with *Atriplex prostratum*, the conclusion is reached that the external factor causing prostrate growth is intense illumination, but that the growth movements are really geotropic in their nature. Emphasis is placed upon the fact that there are apparently 2 distinct sorts of plagiotropy, the one resulting from congenital habits of growth, and the other from response to environmental conditions. At times a single species, such as the one under experiment, will prove to consist of 2 such forms. [See also this issue, Entry 6936].—Geo. D. Fuller.

6942. WHEELER, WILLIAM MORTON. A new case of parabiosis and the "Ant Gardens" of British Guiana. Ecology 2: 89-103. 3 fig. 1921.—The writer, in 1913, described various species of ants which live in the thorns of species of *Acacia* and in stalks of *Tillandsia*. These ants, as well as others living in balls of earth on branches of trees described by Mann and Ule, occupy the nests with other genera of ants unlike them in appearance and habits. This adaptation of 2 unrelated genera constitutes the parabiosis of the title. The ant nests in

earth balls found by the writer in Kartabo, British Guiana were like those from Bolivia described by Ule and Mann. The earth balls, called "ant gardens" by Ule in 1900, vary in size from that of an orange to that of a foot-ball and surround a twig or branch up to 50-100 feet above ground. The writer found essentially the same types of plants described by Ule, viz. the following epiphytes, *Philodendron myrmecophilum* Engl., *Anthurium scolopendrinum* Kunth. var. *poiteaunum* Engl., *Streptocalyx angustifolius* Mez., *Aechmea spicata* Mart., *Peperomia nematostachya* Link., *Codonanthe uleana* Fitch., *Phyllocactus phyllanthus* Link., *Nidularium myrmecophilum* Ule, *Ficus myrmecophila* Warb., *Marckea formicarum* Damm., *Ectozoma ulei* Damm., *Codonanthe formicarum* Ule and 2 undescribed species of the Gesneriaceae. These belong to widely different families, yet Ule recorded that these plants as a group possessed peculiarities different from other epiphytes, regardless of their great phylogenetic differences. He inferred that the ants sow and care for these gardens and transplant the seeds to new garden-nests; in return for this care the ants are furnished with arboreal nests protecting them against the torrential rains and hot sun. From observations made by the writer the conclusions are reached that Ule's inferences as to the propagation of the plants in the nests or their cultivation by the ants are fallacious. Ant epiphytes were found growing remote from ant nests and the accumulation of plants in a nest is by seedlings derived from 1 or more original plants around which the ants started the nest and new nests are not furnished with seeds from old ones since new colonies of ants are founded by single fecundated queens and not by a division of the workers of an old colony. Finally the mandibles of some of the garden-nest genera are not suited to carry seeds of the size of those of the epiphytes.—H. H. M. Bowman.

6943. WILSON, DOROTHY G. Observations on the leaf of *Senecio gonocladus* Sch. Bip. Trans. & Proc. Bot. Soc. Edinburgh 28: 167-169. 1923.—*S. gonocladus* is a native of south Africa and a distinct xerophyte, characterized by cylindrical, succulent leaves which possess a strip of translucent parenchymatous tissue occupying $\frac{1}{3}$ of the area and running from base to tip on the adaxial side. Experiments demonstrate that this tissue functions as a window permitting light to penetrate to the deep-seated chlorophyll-containing cells.—L. R. Abrams.

GENERAL, FACTORS, MEASUREMENTS.

6944. ALLEN, W. E. The investigation of ocean pasturage. Ecology 2: 215-219. 1921.—The phytoplankton of the ocean affords food for many tiny animals. Studies and surveys of this flora are beset with difficulties and reliable data on the available food supply of fish or other animal life of given oceans or seas are very meager. Net towing is still the most favorable method for studying the plankton of the ocean but this gives no idea of the amount of plant life per volume of water and takes no account of the variations in abundance due to fluctuations of salinity, density, viscosity, or direction or speed of the ocean currents. By making dippings of given volume and then pouring the water through nets the plankton collected in the known volume can be counted and the amount estimated for the particular body of water. This plan is being followed by several investigators at different stations near Scripps Institute, California. By the unlimited increase of such investigation prolonged over centuries of time some idea may be eventually gained of the plankton flora of the ocean. Formalin is recommended for the preservation of material collected, but the use of the Sedgwick-Rafter method of counting diatoms with a counting cell is discouraged on account of the great amount of time and energy consumed for each count. Instead, a shaken mixture of several catches is examined and $\frac{1}{8}$ is counted to get an estimate of diatoms in the samples. The importance of investigations of marine phytoplankton consists in the light that they throw on problems of vital existence in relation to the food of oceanic animals.—H. H. M. Bowman.

6945. BIRD, HENRY. Soil acidity in relation to insects and plants. Ecology 2: 193-197. 1921.—A description of a method for acidulating soils for the purpose of growing acid soil plants on which to rear certain insects is presented. The distribution of certain plants as well as the insects which feed upon them is limited by the acidity of the soil. The problem was the difficulty met with in growing *Rhododendron maxima* and *Sarracenia purpurea* in controlled situations as insect hosts. References to the work of Wherry on the relations

of soil acidity to the Orchidaceae and to that of Hepburn on the enzymes of pitcher-plants are made. The writer mentions keeping *Darlingtonia* (*Chrysamphora*) of California alive easily for a year by his method, whereas the Botanical Gardens of Berlin and of The University of Pennsylvania kept it alive with great difficulty. Observations on the prolific seeding of *Kalmia* along decayed hemlock logs furnished the clue to the method which consists in using an aqueous extract of hemlock-bark (amount of bark or extract not given) diluted with 50 to 100 parts of water. This is found to be much superior to chestnut saw dust, decomposed leaves and wood, or chemicals to reduce or neutralize alkalinity. *Sarracenia*, *Azalea* and many ferns, orchids and bog plants are grown in pots or beds prepared with puddled clay foundations and covered with glass sashes. The efficiency of the hemlock extract is assumed to be due to the tannic acid of which the bark contained 27%. However, other complex constituents of the extract and the decomposition of the tannins by fermentation enter into the reactions.—*H. H. M. Bowman*.

6946. COWLES, H. C. Tension zone between forest and prairie. [Rev. of: POOL, R. J., J. E. WEAVER, AND F. C. JEAN. Further studies of the ectone between prairie and woodland. Univ. Nebraska Studies 18. 1-47., 17 fig. 1918 (see Bot. Absts. 11, Entry 125).] Bot. Gaz. 73: 246. 1922.

6947. DAENIKER, ALBERT. Biologische Studien ueber Wald- und Baumgrenze, insbesondere ueber die klimatischen Ursachen und deren Zusammenkaenge. [Ecological studies on forest and tree limits, especially in relation to climatic causes and their interdependence]. Vierteljahrsschr. Naturforsch. Ges. Zurich 68: 1-102. 1923.—The author presents an intensive study of the structure and form of various species at tree limit, including the histology and form of the stem, twigs, and leaves. The influence of the substratum, temperature, wind, general humidity, light, snow-cover, etc., are discussed. There is a reduction in the development of wood and, in general, a diminution of the size of organs and cells. There is however, variation in the dwarfing, depending on local conditions. Under the influence of a more favorable surface climate, the lower branches are less dwarfed than the upper. There is a much earlier successive mortality than in the more favorable lowland. There is a sharp competition, between certain subalpine plant associations and the juvenile forest, depending on the nature of the substratum, which influences the tension zone between forest and tree limit.—*John H. Schaffner*.

6948. FULLER, GEO. D. West African forests. [Rev. of UNWIN, A. H. West African forests and forestry. 8 mo. 527 p. 110 fig. London, 1920.] Bot. Gaz. 72: 262. 1921.—The author commends the notes on general forest conditions and the illustrations as valuable for the ecologist in giving some data regarding the vegetation of a relatively unknown region. [See also Bot. Absts 11, Entry 184].—*Geo. D. Fuller*.

6949. HALLOWELL, E. Birds and plants near Sowerby Bridge. Naturalist 1924: 17-18. 1924.—This contains notes on the influence of canal traffic on vegetation. The dominant plant is *Hieracium boreale*, and a handsome balsam (*Impatiens glandulifera*) is prevalent.—*W. H. Burrell*.

6950. HANSEN, ALBERT A. The terminology of the ultimate vegetation. Ecology 2: 125-126. 1921.—Attention is called to the misleading interpretation possible in the use of the term, "climax vegetation", since this word, "climax," gives the impression of an abundant vegetation, while present usage refers to a final or ultimate condition regardless of amount. Cowles has suggested the word "ultimate" to express the final evolution of a vegetation covering a certain territory. The writer offers the word, *eschatophyte*, (*eschatos*, ultimate) for any member of the ultimate vegetation. Modifications suggested are, "dominant eschatophyte," "pioneer eschatophyte" and "relic eschatophyte" the last being a term for ultimate plants surviving a fire.—*H. H. M. Bowman*.

6951. HITCHCOCK, A. S. Botanical reconnaissance in southeastern Asia. Ann. Rept. Smithsonian Inst. 1921: 373-380. Pl. 1-11. 1923.—In 1921 the Philippines, Japan, China, and Indo-China were visited for the purpose of studying and collecting grasses. In the Philippines, *Honalocenchrus hexandrus* is used for forage, and *Imperata cylindrica* for thatching in the vicinity of Manila. Introduced grasses are conspicuous as weeds. In Japan the conspicuous grasses are bamboos which in some places exclusively cover large areas in the hill country. At Hue, the capitol of Annam, some work was done at the botanical garden in

determining the identity of plants described in 1790 by Loureiro. The principal study made in China was of bamboos so variously used by man and which cannot be satisfactorily studied from herbarium specimens alone. In spite of the density of population there are extensive areas of non-utilized grassland. The cultivation of rice far exceeds in efficiency that of any other cereal in any other part of the world. A grass, apparently its wild prototype, was collected.—*Neil Hotchkiss*.

6952. MCCOOL, M. M., AND C. E. MILLER. **Use of the dilatometer in studying soil and plant-relationships.** Bot. Gaz. 70: 317-319. 1920.—This instrument showed a marked variation in the amount of water in the plant tissues of various plants that froze at -1.5°C . Less differences were found at lower temperatures. Attempts are made to relate these differences to the amount of water in the soils in which the plants were grown and to the composition of the soil solution. Some directions for the manipulations are given.—*Geo D. Fuller*.

6953. MANN, ALBERT. **The dependance of the fishes on the diatoms.** Ecology 2: 79-83. 1921.—There is a serious ecological problem in connection with the supply and the distribution of the diatom flora on which the food-fishes ultimately depend for their living. The younger the fish put into the waters the larger this food supply must be. Diatoms occupy the same economic relations to aquatic life that grass does in terrestrial life surpassing a thousand fold all other aquatic plants in bulk and in annual rate of reproduction, and they are the sole form of prolific plant life in the open sea. Nevertheless they are very limited in their distribution by genera, and the diatom floras of bays or harbors in different sections of the same coast may be very dissimilar. The writer suggests that there should be measures taken or plans devised for the improvement or multiplication of desirable marine plants paralleling in some measure the efforts in terrestrial agriculture. The paper closes with an appeal to students to take up the ecological problems of both fresh-water and marine diatoms and other algae which are used by fish, directly or indirectly, as food, as e.g., the food of copepods, etc., on which fish feed.—*H. H. M. Bowman*.

6954. MICHAEL, E. L., AND W. E. ALLEN. **Problems of marine ecology.** Ecology 2: 84-88. 1921.—The writers, in co-operation with a committee of The Ecological Society of America, have prepared a scheme of investigation of marine biological problems. The purpose is to encourage more intensive work in this field, and that the scheme outlined may furnish a tentative plan of research along these lines in the future.—*H. H. M. Bowman*.

6955. PEARSALL, W. H. **Phytoplankton and environment in the English lake district.** Rev. Algologique 1: 52-67. 1924.—British freshwater phytoplankton is notable for the large proportion of desmids. The "English Lakes" are deep and have steep rocky shores. The temperature varies from $\pm 3^{\circ}\text{C}$. in winter to $\pm 15^{\circ}\text{C}$. in summer. Oxygen falls to 50-70% of saturation in July and rises to saturation in late summer. CO_2 is low, in June and July 0.5 cc. per l., rising to a maximum of 0.8-0.9 cc. per l. in October and November. The pH of the water is 7.3-7.6, reaching 7.0 in November. The content of carbonates and of calcium salts is low. The dissolved nutrient salt content is low and comparatively uniform in character throughout the lakes, as the underlying rocks are uniform in character. The lakes are to be divided into silted and rocky lakes depending on the kind of bottom. The silted lakes have more Ca, Si, (CO_3), organic matter and available N, but because of adsorption they have less K. In these lakes *Potamogeton* and *Najas* replace a large part of the *Isoetes* and *Nitella* species. The dominant species of the silted lakes are largely diatoms and Myxophyceae. The dominant species of the rocky lakes are largely diatoms and green algae. The phytoplankton of the rocky lakes represents an open (colonizing) plant community; that of the silted lakes, a closed community of long established vegetations. The rocky lakes more closely resemble conditions prevalent at the close of the glacial period. Diatoms require water rich in Ca, Si, (NO_3), 5 mgm. per l. of the 1st being the minimum content requisite for a rich diatom flora. The metabolic bearing of this is discussed. The desmid plankton requires a water poor in Ca and rich in K and Na. Peaty drainage and acidity are not determining features. The dominant desmids are not washed in from tributary swamps, being absent there, but some of the plankton species are derived from the littoral.—*Wm. Randolph Taylor*.

6956. REDWAY, JACQUES W. **City street dust and infectious diseases.** Ecology 3: 1-6. 1922.—Several references are given to studies on dust and its effect in the lower stratum of

the atmosphere, especially on the health of man. Health statistics of several American cities in various years are given and correlations made with methods used in cleaning city streets such as dry-sweeping or the washing of pavements. Microscopic examination of dust ordinarily found in buildings reveals it to be comminuted ashes, paving material, horse manure, textile fibres and microorganisms. The commonest germs in city street dust the colon bacilli and streptococci, the former from animal excrements and the latter from human expectoration, etc. Colon bacilli occur in a ratio of 1:1000 in relation to other micro-organisms in street dust; indoors the ratio is reduced $\frac{1}{2}$. Pneumococci and diphtheria bacilli are occasionally found in street dust but in the latter a high percentage of infection occurs through house-dust. Dry, still air has little power to convey disease organisms and abundant evidence is accumulating to show that infectious air is also dust laden air. Washing or screening the air in mechanically ventilated buildings and varnishing or oiling floors reduces the dust occurring indoors, while washing paved streets and tarring the surfaces of others greatly reduces the dust load of city air.—*H. H. M. Bowman.*

6957. REDWAY, JACQUES W. **The dust of the upper air.** *Ecology* 2: 104-109. 2 fig. 1921.—A description of the strata of the atmosphere is given. The lower stratum of convection extends 7 miles above sea level; the upper stratum has been explored to a height of 20 miles but extends far beyond that. This upper air lacks carbon dioxide, argon disappears at a height of 40 miles and above 70 miles this air consists only of minute quantities of H, He and dust. This dust is in a very fine state of division and in the absence of convection its diffusion is aided by electrical disturbances. The dust of the lower stratum is moved by convection currents and laterally by winds. Dust particles less than 1μ in diameter fall so slowly that their rate of descent is not measurable, and if ionized they do not fall at all. The only way that this dust reaches the earth is through the particles becoming nuclei for the condensation of moisture rather than through their own gravity. Even if precipitated to the earth they immediately escape into the air again when freed of their load of moisture. Particles of over 1μ (1.85μ) require 6 to 9 hours to fall as many feet, dependent on the humidity. Those in the lower air are the cause of cloud and fog formation. Floating dust in high altitudes is produced by volcanic action alone. Wind blown dust rarely ascends over 2000 feet. The expansive force of H, He, SO_2 and steam under pressures of tons per square inch, when released, blows the lava magma into dust and shoots it more than 20 miles into the air where the higher and smaller particles float for years and some never fall to the earth. The mass of particles forms a screen which intercepts so much of the sun's heat that the temperature of the earth for several years after severe eruptions is materially reduced. The writer cites records since 1783 as proof, and mentions the cold summers of 1901 and 1902 following the eruption of Mont Pelée and those of 1911 and 1912 following that of Katmai in Alaska. Laboratory tests with dust screens show the reduction in temperature and indicate the profound effect of dust on temperature in connection with life on the earth.—*H. H. M. Bowman.*

6958. RIGG, GEORGE B. **Some factors in evergreenness in the Puget Sound region.** *Ecology* 2: 37-46. 1 fig. 1921.—A large number of broad-leaved sclerophyllous plants as well as conifers are found in the environment of Puget Sound. In the state of Washington west of the Cascade Mountains there are 52 species of woody evergreens, 36 being angiosperms and 16 gymnosperms. The conspicuous genera of the former group are the tree, *Arbutus*, and the shrubs, *Rhododendron*, *Ledum*, *Berberis*, *Vaccinium*, *Oxycoccus*, *Ceanothus*, *Arctostaphylos* and *Gaultheria*. *Rhamnus purshiana* is a tree which varies between a deciduous habit and evergreenness dependent on conditions; and in the same category is the shrub, *Vaccinium parvifolium*. Evergreen herbs are *Claytonia*, *Stellaria* and *Hypochaeris* and the ferns, *Lomaria*, *Polypodium* and *Polystichum*. The function and structure of evergreen leaves and the effects of low temperatures on the cells of leaf-tissue and on the content of sugars and starches in evergreen leaves are presented. Sugar rather than starch is accumulated in winter in such leaves. A chart shows curves of the starch to sugar ratios in *Arbutus* and *Stellaria* for the winter and spring months. Tables of air and soil temperatures and precipitation at Seattle for the year 1918 are given. The climatic conditions about Puget Sound seem to be moderate temperatures of both soil and air throughout the year, high moisture contents of both soil and air in winter and low contents in summer, and the absence of snow. These condi-

tions favor root growth, and the high moisture content of the air in winter keeps the transpiration rate low. The absence of sudden changes to low temperatures and the hardening effect of continuous cool temperatures in the fall enable the plants to withstand lower temperatures in winter. Snow as a protective factor is not to be considered, due to its usual absence. Where rare snow-falls do occur the noteworthy effect is their mechanical injury to the trees.—*H. H. M. Bowman.*

6959. RÜBEL EDUARD: *Die Entwicklung der Pflanzensoziologie.* [The development of phytosociology.] *Vierteljahrsschr. Naturf. Ges. Zürich* 65: 573-604. 1920.—The place of plant sociology is sought in relation to geobotany, of which it is considered a part, and to the other branches of botanical science in general. The term "plant sociology" itself is recent originating with Höck in 1906, and since used by Flahault, Rübel, DuRoi, Fries and Tengwall, and R. M. Harper. The point of view had very early beginnings, although earlier workers injected environmental considerations into what is properly a physiognomic concept Linnaeus (1737) spoke of "regiones," Hedenberg (1745) of "stationes plantarum," Heir (1823) of "localities," Flahault (1893) of "stations." The physiognomic outlook appeared with Schouw's "etum" ("Pinetum" etc.) system (1823), with the "Gruppen geselliger Pflanzen" of Willdenow and von Humboldt, and with Sendtner's "vegetation-forms" (1854). Lorenz (1854) and Kerner (1863) made notable advances in the development both of physiognomical and stratification concepts which were much refined by later workers, especially by Drude (1890) and Schröter (1892); Warming's work (1895) came as a culmination. Brief concluding sections sum up present-day work on the Continent, in Britain, South Africa and America and point out possible economic applications.—*Frank Thone.*

6960. THONE, FRANK. *The rapprochement in ecology.* *Bot. Gaz.* 73: 497-499. 1922.—This is a review of articles by Rübel, Romell, Braun-Blanquet, Fitting and Palmgren on the development and content of modern ecology. Attention is called to the divergence between the American and European schools, the former placing emphasis on the dynamic and genetic aspects, while the latter, originating from the older study of floristic geobotany, has retained much of the taxonomic standpoint, developing methods of distinguishing, classifying and arranging vegetational units. The Americans have adopted but few of the methods of the European school.—*Geo. D. Fuller.*

6961. Y., R. H. *Plant ecology in Switzerland.* [Rev. of: FREY, ED. *Vegetationsverhältnisse der Grimselgegend in Gebiet der zukünftigen Stauseen.* (Plant ecology of the Grimsel region.) *Mitteil. Naturf. Ges. Bern* 1921: 85-281. 9 pl., 5 fig., map. 1922 (see Bot. Absts. 13, Entry 3385).] *Nature* 113: 585-586. 1924.—This is regarded as "a good example of the thorough vegetational surveys which are being carried on so effectively at the present time in Switzerland."—*O. A. Stevens.*

FLORISTICS

6962. BEAUMONT, A., AND G. JESSOP. *Alchemilla alpina* L. in Derbyshire. *Naturalist* 1923: 410. 1923.—This records an extension of the known southerly limit of the plant in Britain on Pin Dale near Castleton at 800-900 feet altitude on Carboniferous limestone.—*W. H. Burrell.*

6963. BRINKMAN, A. H. List of Alberta hepatics. *Canadian Field Nat.* 37: 105-106. 1923.—This is a list of 87 hepatics most of which are Jungermanniales.—*W. H. Emig.*

6964. COWLES, H. C. *Origin of the Hawaiian flora.* [Rev. of: CAMPBELL, D. H. (1) *The origin of the Hawaiian flora.* *Mem. Torr. Bot. Club* 17: 90-96. 1918. (2) *The derivation of the flora of Hawaii.* *Leland Stanford Junior Univ. Publ.* 1. 1-34. 1919. *Bot. Gaz.* 72: 52-53. 1921.—The reviewer approves the conclusion that the Hawaiian flora has been derived for the most part from the southern Pacific region, and that the Hawaiian Islands are a remnant of a north-eastern extension of some large land mass once closely connected with south Pacific lands. [See also Bot. Absts. 11, Entry 141].—*Geo. D. Fuller.*

6965. FASSETT, NORMAN C. *The Hypocrites.* *Maine Nat.* 2: 141-142. 1 pl. 1922.—These are 3 small rocky islands of Boothbay, Maine, the largest about $\frac{1}{2}$ mile long. A list of 27 species of flowering plants is given.—*C. A. Weatherby.*

6966. FIRTH, JOE. Winter purslane (*Claytonia perfoliata*). *Naturalist* 1924: 18. 1924.—Now naturalized in the Wirral Peninsula, this plant thrives on light soils in dune pastures at Wallasey and Leasowe.—*W. H. Burrell*.

6967. HOFFMAN, RALPH. Flora of Berkshire county, Massachusetts. *Proc. Boston Soc. Nat. Hist.* 36: 171-382. *Map.* 1922.—This paper contains short accounts of previous studies of the physiography of the county, and of the habitat distribution of certain species, and an annotated list of the vascular plants. There are several keys including 1 to the varieties of *Athyrium angustum* and *Lactuca canadensis*, and of the genera *Elymus*, *Panicum*, *Scirpus*, *Juncus*, *Sisyrinchium*, *Amelanchier*, *Desmodium*, *Arctium*, *Solidago*, etc. In the list are represented 118 families, 474 genera and 1377 species of which 254 are introduced. Besides these, 209 varieties, 70 forms and 96 "fugitives," are listed.—*John H. Schaffner*.

6968. KERN, FRANK D. Observations on the dissemination of the barberry. *Ecology* 2: 211-214. 1921.—*Berberis vulgaris* is a native of the mountains of middle and western Asia. The writer has found seedlings near old bushes indicating easy dissemination by the fruits. He concludes that birds are important agents and, in spite of the sharp spines on the branches of the plant, has found that cattle are also prolific carriers. Historical references show that the barberry was carried to new settlements by the colonial pioneers who used its berries for making jelly.—*H. H. M. Bowman*.

6969. MOUSLEY, HENRY. Further notes on the ferns of Hatley, Quebec. *Canadian Field Nat.* 38: 50-51. 1924.—The addition of 3 species and 2 varieties, increases the list of Hatley ferns to 51 species and varieties.—*W. H. Emig*.

6970. MOUSLEY, HENRY. Further notes on the orchids of Hatley, Stanstead County, Quebec, 1923. *Canadian Field Nat.* 38: 61-63. 1924.—The addition of 5 species and varieties brings the number of orchids to 40. Several observations on the rhizomes are included.—*W. H. Emig*.

6971. ROPER, IDA M. *Spartina Townsendii* at Clevedon, Somerset. *Kew Bull.* 1922. 351-352. 1922.—Use of this plant as a mud-binder in the hope of raising the flats below Clevedon was not a success, the tidal race being too strong.—*T. J. Fitzpatrick*.

6972. SAMUELSSON, GUNNAR. Växtlokaler från Västmanland. 1. [Plant localities from Västmanland (province in Sweden).] *Svensk Bot. Tidskr.* 17: 401-448. 1923.—The work contains extensive lists of stands of pteridophytes and spermatophytes.—*O. Heilborn*.

6973. STOMPS, THEO J. A contribution to our knowledge of the origin of the British flora. *Rec. Trav. Bot. Neerland* 20: 321-336. 1923.—The paper deals with the theory that at one time, when the North Sea was land, the Rhine took its course through the eastern part of England. Following a brief geological discussion of the problem, a study is made of the distribution of certain species of Rhine plants and of those confined to the "Breckland-sands" in England to see if they support the theory. Several of the species common to both seem to indicate the correctness of the hypothesis.—*M. B. Morgan*.

6974. WALLER, A. E. A new attack on problems of ecology. *Ecology* 2: 145-149. 1921.—The paper gives a critical analysis of Weaver's views [See Bot. Absts. 8, Entry 97.] on the transition of the prairies into the great cereal growing regions of the U. S. A., and discussions of the groups of grass genera which were dominant in the various types of prairie.—*H. H. M. Bowman*.

VEGETATION

6975. ALEXANDER, M. L. Wild life resources of Louisiana; their nature, value and protection. *Dept. Conservation, Louisiana Bull.* 10. 164 p., 34 fig. 1921.—Devoted chiefly to animal life, this bulletin contains also a brief description of the different types of forest. A map shows the location of the shortleaf pine hills, the hardwood uplands, the longleaf pine hills and flats, the river woodlands, the hardwood and cypress swamps, the prairies and the coastal marshes.—*A. M. Taylor*.

6976. Доктуровский, В. С. [DOCTUROVSKI, V. S.] Торфяные бодота, их строение и образование. [The moors, their structure and development.] 608 p. Бендеры. [Bender]. 1915.—This paper gives the results of a general study of bogs, their classification, descriptions of their vegetation, and changes in them correlated with climatic changes.—*Author*.

6977. DUDGEON, WINFIELD.—A contribution to the ecology of the upper Gangetic plain. Jour. Ind. Bot. 1: 1-29. 9 fig. 1920.—This region, in the vicinity of Allahabad with 90 cm. of precipitation, has 3 very distinct seasons: (1) June to September with high precipitation, high humidity, high temperature and low insolation; (2) October to February with low temperature, low rainfall, high humidity and high insolation; and (3) March to May with low rainfall and humidity but high insolation and temperature (mean 80°F.).—The existing vegetation is much influenced by the population of 530 human beings and 470 grazing animals to the square mile. Most of the area is covered with dry meadow and thorn scrub, but it seems certain that these associations, now balanced against intense human influences, are really the remains of a much richer climatic vegetation. The author concludes that "if the retrogressive influence of biotic (human) factors were removed, the vegetation would pass through progressively higher forest stages of (1) fully developed thorn scrub, (2) pioneer monsoon deciduous forest, and (3) climatic climax monsoon deciduous forest, a forest of considerable density and luxuriance." This forest would probably show *Terminalia tomentosa* and *Tectona grandis* as dominant tree species.—Geo. D. Fuller.

6978. HOFFMANN, J. V. *Adaptation in Douglas Fir*. Ecology 2: 127-131. 1921.—[A study of seed trees of *Pseudotsuga taxifolia* was made to observe tendencies toward adaptation of this species in the region of the Cascade Mountains from central Oregon to northern Washington, in which it is the dominant species. A test of its adaptation and ability to compete with other species lay in its power to produce good seed and to establish seedlings. Seed tests were made of 127 trees selected from 29 situations representing differences in soil and elevation, and in age and density of stand, etc., of the pistillate parents. These trees varied greatly in quantity and quality of seed produced. The younger trees developed larger cones and heavier seed. Trees infected with fungi produced as many cones but less fertile seeds than sound trees. The quality of the soil in which the parent trees grew was also reflected in the vitality of seedlings. Tables show that all the environmental conditions of the parent trees have a pronounced effect on the seedlings, but the conclusion is reached that the effect is not sufficient to warrant changes in present methods of forestry which would favor individual environmental factors. Selective cutting of trees and the choice of good seed for nursery stock are recommended.—H. H. M. Bowman.]

6979. KINCER, J. B. *The relation of climate to the geographic distribution of crops in the United States*. Ecology 3: 127-133. 1922.—Agricultural statistics show that production of the staple crops in the United States is in definite areas controlled by topography, soil, distance from market and climate. Only $\frac{1}{2}$ the country permits of crop production by the ordinary methods of farming, and of the total land area of the United States 75% is classified as unimproved. This classification at present includes the forests. The moisture requirements of crops are discussed and the precipitation by geographic areas and annual amounts is presented, as well as the evaporation statistics for these areas. These data are considered also in relation to the seasonal distribution of rainfall and show the country as a whole is the most favored of the world for agriculture. For a consideration of crop production in relation to temperature, the writer divides crops into cool and warm-climate crops and shows that for the area east of the Rocky Mountains production falls into 5 provinces, each with a specific crop character. These are discussed in detail, the summer and winter temperatures and the crops suitable for each being given.—H. H. M. Bowman.]

6980. P[EARSTALL], W. H. A Swedish "Moss". [Rev. of: OSVALD, H. *Die Vegetation des Hochmoores Komosse*. [Vegetation of the Komoss raised bog.] xviii + 436 p., 11 pl., map. Almqvist & Wicksells: Upsala, 1923.] Jour. Ecology 12: 142-144. 1924.—This contribution is characterized as abounding in detail but illustrating a weakness of the methods advocated by the Upsala school in splitting the vegetation up into numerous "associations," many of which are unimportant and identical in their dominant species.—Geo. D. Fuller.

6981. SATTERTHWAIT, A. F. *Notes on the food plants and distribution of certain billbugs*. Ecology 2: 198-210. 1 fig. 1921.—The billbugs of the genus *Calendra* are destructive pests on corn and other cereals in the State of Missouri, especially in areas being reclaimed from swamps in the southeastern corner of the state. The larvae bore into and feed on the stems and rhizomes of the host plants among which are: *Typha latifolia*, *Carex lurida*, *Cyperus erythrorhizos*, *Glyceria septentrionalis*, *Leersia oryzoides* and *Rhynchospora corniculata*, as

well as species of blue-grass (*Poa*), orchard-grass (*Dactylis*), and rye-grass (*Elymus*). By destroying the food plants completely, the billbugs are prevented from breeding and the crops are saved. The writer gives the distribution of 11 species of the billbug genus, *Calendra*, and the host plants for each.—*H. H. M. Bowman*.

6982. SHULL, CHARLES A. **Some Changes in The Vegetation of Western Kentucky.** Ecology 2: 120-124. 1921.—The changes especially noted occur in the "barrens" and in the Cane Hill region of Kentucky along the Mississippi River. The barrens occur in several parts of the state and are so called from the fact that formerly they were large treeless meadows or prairies and not actually barren. The best known is "The Barrens" lying just south of Green River. The geology of this region is given. The absence of trees from these barrens was probably due to the custom of the Indians and the early settlers, of burning over the meadows each spring so as to chase game and secure better pasturage for their cattle. When this custom ceased the natural forest cover again invaded the areas, pioneers being *Quercus marilandica* and *Q. rubra*. These areas are now completely reforested except where farmed; estimates show that these former "barrens" now contain about 800,000 acres of forest. Another change is the almost complete disappearance of cane, *Arundinaria macrosperma*, from the Cane Hills region. In early times, about 1793, this plant covered all the hills and bluffs along the river and flourished under the upland forest-trees, reaching heights of from 10-25 feet, and as late as 1860 it was still abundant on the hills. It has now almost completely disappeared, except in certain valleys in Ballard, Carlisle, Hickman and Fulton Counties, due to the grazing of cattle, to floods, and to the poor seed production of the plant in this part of its range.—*H. H. M. Bowman*.

6983. WALL, A. **The indigenous grasses of Mount Herbert, Banks Peninsula, and its neighborhood.** New Zealand Jour. Sci. and Tech. 6: 144-147. 1923.—The grassland is much altered from its primitive conditions, introduced species affording feed for sheep. There are 30 indigenous species recorded.—*H. H. Allan*.

FOREST BOTANY AND FORESTRY

W. N. SPARHAWK, *Editor*

(See also in this issue Entries 6851, 6874, 6935, 6938, 6946, 6947, 6948, 6975, 6977, 6978, 6982 7097, 7221, 7252, 7265, 7266, 7419, 7430, 7465, 7484, 7498)

6984. ANONYMOUS. **Note sur les effets de la sécheresse en 1921.** [The drouth of 1921.] Bull. Soc. Centrale Forest. Belgique 30: 478-485. 1923.—Precipitation deficiencies are given for various stations for August-October 1920, and May-October 1921. The short periods of marked drouth are also mentioned. The author then describes the effects on forest trees, seedlings, and plantations in different regions.—*H. T. Gisborne*.

6985. ANONYMOUS. **Transport des produits forestiers par chemin de fer.** [Railroad charges for transportation of forest products.] Bull. Soc. Centrale Forest. Belgique 30: 447-449. 1923.—Costs of transportation are given for 47 classifications of forest products over distances of 50, 100, and 150 kilometers.—*H. T. Gisborne*.

6986. ANONYMOUS. [Rev. of: WHITE, C. T. **An elementary text-book of Australian forest botany.** Vol. I. *v+223 p., 105 fig.* (Published under the direction of the forestry commissioners of New South Wales.) John Spence: Sydney, 1922 (see also Bot. Absts. 13, Entry 5002).] Nature 113: 601. 1924.

6987. ANONYMOUS. **The timbers of Guiana.** [Rev. of: STONE, HERBERT. *Étude descriptive sur les bois utiles de la Guyane française.* (Description of the commercial woods of French Guiana.) 416 p., 7 pl. Faculté des Sciences, Musée Colonial: Marseille, 1923.] Nature 113: 528. 1924.

6988. B., L. C. W. **Forests and rainfall.** Nature 113: 511. 1924.—This is a brief note with reference to several articles.—*O. A. Stevens*.

6989. BELYEA, HAROLD C. AND OLIVER M. PORTER (compilers). **Foresters' tables for New York State.** N. Y. State College of Forestry Bull. 14. 1-83. Syracuse, [1923?]-This is a collection of tables commonly needed by foresters in New York. It includes surveyors' tables, tables for scaling logs and other forest products, volume tables for northeastern trees, and miscellaneous tables.—*W. N. Sparhawk*.

6990. BENJAMIN, L. R. The manufacture of pulp and paper from Australian woods. *Inst. Sci. and Indust. Australia Bull.* 25. 1-92. *Illus.* 1923.—The investigations here detailed show that certain species of *Eucalyptus* and a few species of other genera can be used for making pulp. Pulp from *Eucalyptus pilularis* can be used to the extent of 60% or more in making book paper. Proper coppicing of *Eucalyptus* results in dense stands capable of producing 40 cords an acre in 10 years or less. The largest supplies of such stands are in Victoria and Tasmania. The wood is easily pulped, cost of production should be low, and the pulp may be converted into a fairly wide range of papers. The bulletin contains much detailed information.—*L. R. Waldron.*

6991. BRISCOE, JOHN M. Forest influences. *Maine Nat.* 1: 25-34. 1921.—The functions of forests in nature and in the economic and esthetic life of man are discussed.—*C. A. Weatherby.*

6992. BUYSENS, JULES. Forêt, nature et art. *Bull. Soc. Centrale Forest. Belgique* 30: 427-433. 1923.

6993. CARLSON, K. A. Silvicultural notes on *Cedrela toona*: with reference to natural regeneration in government plantation, Barberton. Union of South Africa Forest Dept. Bull. 4. 1-19. Pretoria, 1921.—This species, a native of India, has been introduced in South Africa, and natural reproduction is now becoming established. Its habits, rate of growth, and silvicultural treatment are discussed. Because the tendency to branch is persistent even in dense stands, skilful treatment is necessary to secure tall clean stems.—*C. F. Korstian.*

6994. CARLSON, K. A. The growing of mine props on the high veld. Union of South Africa Forest Dept. Bull. 1. 1-12. Pretoria, 1920.—The choice of species suitable for mine props is limited, because of climatic and soil conditions, to *Eucalyptus viminalis* and *E. sideroxyylon*. Silvicultural notes are given for these species.—*C. F. Korstian.*

6995. CARY, AUSTIN. Maine forestry in retrospect and in prospect. *Maine Nat.* 2: 148-154. 1922.—The author regards the prospect for the Maine forests as hopeful because, on the whole, they have been managed by their owners with more intelligence than those in many other regions.—*C. A. Weatherby.*

6996. COCKAYNE, L. Professor E. H. Wilson on New Zealand forests and forestry. [Rev. of: WILSON, E. H. (1) Notes from Australasia, II, The New Zealand forests. *Jour. Arnold Arboretum* 2: 232-236. 1922 (see Bot. Absts. 12, Entry 2337). (2) Northern trees in southern lands. *Jour. Arnold Arboretum* 4: 61-90. 1923 (see Bot. Absts. 12, Entry 6313).] New Zealand Jour. Sci. and Tech. 5: 218-222. 1923.—Wilson's theory as to replacement of taxad and coniferous forests by broad-leaf trees in New Zealand, had been put forth independently in a broader form by the reviewer. The reviewer correlates the change with change of climate affecting 2 distinct elements of the flora—the subantarctic and the palaeotropical. Evidence is adduced combatting Wilson's theory that "the tubercles [on the roots] are the controlling factors in the rate of growth of the taxads and conifers of New Zealand." The subject requires a searching investigation.—*H. H. Allan.*

6997. COLLEAUX, H. Quelles sont les essences feuilles précieuses à cultiver en mélange avec le hêtre? Moyens culturaux à mettre on oeuvre pour reconstituer la futaie mélangée. [Broad-leaved species most valuable in mixture with beech. Cultural methods for improvement of mixed high-forest.] *Bull. Soc. Centrale Forest. Belgique* 30: 390-404. 1922. [See also Bot. Absts. 13, Entry 5773.]

6998. DALLIMORE, W. Beech wood and the brush industry. *Kew Bull.* 1922: 255, 256. 1922.—The use of beech wood in the manufacture of brushes in the British Isles is described.—*T. J. Fitzpatrick.*

6999. DALLIMORE, W. The Douglas fir Chermes. *Kew Bull.* 1922: 300, 301. 1922.—During the last few years the rapid spread of the Douglas fir Chermes (*Chermes cooleyi*) has caused alarm among foresters. The natural habitat of this insect is British Columbia; recently it has been imported into England. Fortunately the insect confines its depredations to the leaves, and causes less injury than allied species which attack young shoots and bark. Investigations so far indicate that the effects will not be as disastrous as previously feared. Statements are based on Bull. 4 of the Forestry Commission.—*T. J. Fitzpatrick.*

7000. DANA, SAMUEL T. A northeastern forest experiment station. *Maine Nat.* 2: 36-42. 1922.

7001. DANA, SAMUEL T. **The forests of Maine.** *Maine Nat.* 2: 86-94. 1922.—Three-fourths of the area of Maine is forested. Lumbering ranks 4th among the industries of the state. Forest products, with an annual value of \$12,000,000, rank 3d among farm crops. Forests in the north produce chiefly spruce and balsam fir; those in the south, white pine. Of the last, Maine is the 2nd largest producer. Protection from fire, insects, and disease, adjustment of the annual cut to the annual growth, which it now far exceeds, and the establishment of state forests are needed to preserve the State's forest industries.—*C. A. Weatherby.*

7002. DANA, SAMUEL T. **The northeastern forest experiment station.** *Maine Nat.* 4: 50-53. 1924.—This recently established station of the U. S. Forest Service, with headquarters at Amherst, Mass., will study forest problems in New England and New York. The study of spruce growth and yield is already under way. It is proposed to constitute a Forest Research Council, made up of representatives of interested organizations, to act in an advisory capacity to the station and other agencies of research and as a clearing-house of information among them.—*C. A. Weatherby.*

7003. DELEVOY, G. **La protection des forêts coloniales.** [Protection of the colonial forests.] *Bull. Soc. Centrale Forest. Belgique* 30: 404-406. 1923.—The author recommends the formation of a Belgian colonial forest service to study and administer the African forests under Belgian ownership.—*H. T. Gisborne.*

7004. ECKBO, NILS B. **The seasoning of South African woods.** *Union of South Africa Forest Dept. Bull.* 5. 1-43. Pretoria, 1922.—The general principles and methods of seasoning wood are discussed. The high humidity regulated kiln has given good success in seasoning yellow-wood (*Podocarpus elongata*, *P. thunbergii*, and *P. falcata*) and karri (*Eucalyptus diversicolor*). The latter is one of the less easy woods to season.—*C. F. Korstian.*

7005. FARRINGTON, H. A. **Report on the forest administration of the Central Provinces for the year 1921-22.** Part I, Statements, 75 p. Part II, Report, 34 p. Nagpur, 1923.—Some progress was made in revision of working plans and in silvicultural investigations of different forest types. The drought ruined the lac crop, destroyed much teak and sal and injured seedlings of other species; and 783,927 acres were burned over out of a protected area of 6,585,749 acres. The principal silvicultural methods used were improvement fellings (97,709 acres), coppice with standards (67,359), selection fellings (10,792), and clear cutting (750). Grazing regulation is still unsolved. Detailed tabulations are a part of the report.—*S. B. Show.*

7006. GARDNER, C. A. **The forest formations of Western Australia: V. The salmon-gum forest.** *Australian Forest. Jour.* 7: 38-45. 1924.—This type of forest, characterized by the presence of salmon gum (*Eucalyptus salmonophloia*) in varying density, is climatically governed by an average rainfall of 12 inches (not below 10 nor above 20 inches), most of which falls during the coldest months. Many other eucalypts are often associated with this species.—*C. F. Korstian.*

7007. GIBSON, A. J. **Progress report on forest administration in the Punjab for the year 1922-23.** 46 + *CLXXXIII* p. Lahore, 1923.—Fire protection was 99.5% successful, and reclamation work by stepping of ravines was continued. In chil forests good regeneration followed a heavy fire. Little progress was made in preparation of working plans. The need for more cultural operations is urged. Irrigated plantations now total 13,374 acres. Considerable research, particularly in utilization and timber testing, is under way. Departmental exploitation was much reduced. A combination of agriculture and forestry is showing promise in dealing with native farmers. Detailed tabulations are a part of the report.—*S. B. Show.*

7008. GRAVES, HENRY S. **The public forest.** *Maine Nat.* 2: 155-157. 1922.—"Public forests are an essential feature of a successful policy of forestry in a state. No country has yet succeeded in forestry which does not have a system of public forest reservations."—*C. A. Weatherby.*

7009. HUTCHINS, D. E. **Rate of growth of trees in relation to forestry. A criticism of Mr. E. Maxwell's paper.** *New Zealand Jour. Sci. and Tech.* 3: 1-7. 1920.—This paper traverses the data and conclusions of Maxwell's paper [see this issue, Entry 7011] and rejects them as unreliable and misleading.—*H. H. Allan.*

7010. KAUFMANN, J. E. **Treeplanting in East Griqualand.** *Union of South Africa Forest Dept. Bull.* 7. 1-22. 11 fig. Pretoria, 1923.—The different species are listed which may be grown for timber and shelter under the somewhat adverse conditions obtaining in the upper

and colder districts of East Griqualand; and methods for their treatment are discussed. Experience has shown that the following species are suitable for planting on a large scale: *Eucalyptus globulus*, *E. saligna*, *E. viminalis*, *E. amygdalina*, *E. stuartiana*, *E. rostrata*, *E. sideroxylon*, *E. polyanthemus*, *E. coriacea*, *Cedrus deodara*, *Pinus insignis*, *P. pinaster*, *P. canariensis*, *P. halepensis*, *P. longifolia*, *Cupressus macrocarpa*, *C. lusitanica*, *C. sempervirens*, *C. arizonica*, *C. torulosa*, *Quercus pedunculata*, *Acacia melanoxylon*, *A. decurrens*, *Populus italica*, *P. serotina*, *P. deltoidea* var. *missouriensis*, *P. canescens*, and *Robinia pseudacacia*. [See also Bot. Absts. 13, Entry 5791.]—*C. F. Korstian*.

7011. MAXWELL, E. Rate of growth of indigenous and exotic trees in New Zealand. New Zealand Jour. Sci. and Tech. 2: 371-376. 1 fig. 1919.—Figures are given, derived from various authorities and from original measurements, of the rate of growth of 9 indigenous and 53 exotic timber trees. Kauri, the fastest grower of the indigenous trees, takes 60 years to increase 12 inches in diameter, while no exotic listed takes longer than 31 years (*Pinus radiata* 11.1, eucalypts 14.3, *Sequoia sempervirens* 13.6, Douglas fir 22.7, oak 25.3 years). The conclusion is reached that it would be most unwise to grow indigenous species for timber production. [See also this issue, Entry 7009.]—*H. H. Allan*.

7012. MERENDI, ARIBERTO. Les forêts. Renseignements statistiques concernant différents pays. [Forest statistics.] iii + 418 p., 2 fig. Internat. Inst. of Agric.: Rome, 1924.—Data covering forest areas, species, form of management, ownership, annual growth, annual cut, annual damages by fire and other causes, and exports and imports of forest products are presented for Germany, Austria, Belgium, Denmark, Finland, France, Great Britain, Greece, Italy, Lithuania, Norway, Netherlands, Portugal, Sweden, Switzerland, Czechoslovakia, Canada, U. S. A., Japan, Algeria, and French Morocco. A 3-page bibliography is appended.—*W. N. Sparhawk*.

7013. MILLER, O. B. A list of some native names of trees, shrubs, etc., in use in the Transkeian Territories. Union of South Africa Forest Dept. Bull. 8. 1-23. Pretoria, 1923.—Part I is an index of the local names in "isi-Xosa," the language of the Transkeian native.—Part II contains a list of botanical names, Xosa names, the meanings of some of the native names and the native uses for various trees, where such information would assist a native in identifying them for a collector.—*C. F. Korstian*.

7014. MORRISON, W. G. Some proposals with regard to natural afforestation in a New Zealand mountain area. New Zealand Jour. Sci. and Tech. 2: 339-349. 3 fig. 1919.—In the vicinity of Hanmer, South Island, New Zealand, on poor tussock-grassland, natural seeding is taking place from plantations of exotic trees, in areas infested with hares and rabbits, and heavily grazed by sheep, horses, and cattle. Wind is practically the sole seed-distributor. The species reproducing themselves are: *Pinus radiata*, *P. pinaster*, *P. sylvestris*, *Betula alba*, *Quercus pedunculata*, and *Larix europaea*.—A summary of the ecological conditions of the locality is followed by a consideration of measures looking toward the extension of forests by natural spread. The establishment of groups of "mother-trees" is favored.—*H. H. Allan*.

7015. MUNNS, EDWARD N. Effect of location of seed upon germination. Bot. Gaz. 72: 256-260. 1921.—Using cones of *Pinus Jeffreyi* collected in 1919 in Lassen County, Calif., it was found that there was no relation between the germination factor and the position on the cone from which the seeds were taken. There was a decided decline in germination percentage with decrease in size of seed. Seed from the lower portion of the cone and from the larger cones germinated first.—*Geo. D. Fuller*.

7016. P. Les anciennes industries forestières dans la province de Luxembourg. [Old forest industries in Luxemburg.] Bull. Soc. Centrale Forest. Belgique 30: 437-439. 1923.—Results of a census of forest industries made in 1764 are restated.—*H. T. Gisborne*.

7017. PICCIOLI, LODOVICO. Effetti della resinazione sull' accrescimento degli alberi sulle proprietà tecniche del legno e sulla fruttificazione. [Effect of turpentine upon growth, properties of wood, and seed yield.] Ann. R. Ist. Superiore Forestale Nazionale 7:1-47. 1 col. pl., 11 fig. 1922.—This article presents data on various conifers which are or might be turpentine. The author concludes that turpentine tends to injure the size and germinating power of the seed and to cause weak seedlings, although there is some evidence to the contrary. The effect on the growth of trees is illustrated. It was found

to vary with species and methods used and with environmental factors, such as climate, soil, and previous vigor of growth. This is also true in regard to the quality and mechanical properties of the wood. Strength tests showed much variation and inconsistency due to lack of homogeneous material. *Pinus maritima* is particularly recommended as profitable if carefully worked. With proper methods, mature trees suffer little from turpentine, since much of the affected wood is removed in manufacturing. To determine the advisability of turpentine, the size of the tract and other factors, such as transportation and capable supervision must be considered. Tables giving, for different years, the weights of seed from turpentine and unturpentine pines, are included. A long list of references is appended.—*Eloise Gerry and Susan H. Ballou.*

7018. POSKIN, A. Influence de l'origine du pin sylvestre. [Influence of seed origin on *Pinus sylvestris*.] Bull. Soc. Centrale Forest Belgique 30: 368-379. 1923.—This report gives the results of 11 years' investigation of the effect of origin of seed on germination and growth. All the seed was collected in Belgium, most of it in 1 province. The ages of the parent trees varied from 9 to 100 years. Tables show detailed conditions and results of each seed lot, including: region of origin; parentage; seed dimensions; weight per 100 fresh cones; moisture content of fresh cones; weight of clean seed per 100 kilos of cones, both fresh and at 15% moisture content; germination percentage at 3, 6, 10, 20, and 30 days; decrease of germination percentage each year up to 9 years of storage; and weight and length of tops and roots. The results are summarized by regions, according to age and form of parent trees.—*H. T. Gisborne.*

7019. POSKIN, A. Mesures propres à empêcher l'exploitation abusive ou la destruction des forêts utiles à l'intérêt général. [Prevention of exploitation and destruction of forests.] Bull. Soc. Centrale Forest. Belgique 30: 485-494. 1923.—This report, presented to the 1923 International Congress of Agriculture at Paris, deals with the following: (1) The protective and productive value of forests to Belgium. (2) Devastation and danger to the forests. (3) Means of protecting the forests. (4) Laws for forest protection. (5) International aspects of forest protection. International agreements are suggested for the protection of forests affecting the flow of streams which traverse 2 or more countries.—*H. T. Gisborne.*

7020. QUAIRIERE, C. Experience internationale sur l'origine du pin sylvestre. [Effect of origin of seed on *Pinus sylvestris*.] Bull. Soc. Centrale Forest. Belgique 30: 379-389. 1923.—Scotch pine seed were collected at 12 different localities from Scotland to Russia and Hungary, and extracted at a station in Germany. Some were sown in the Groenendael nursery in Belgium. The plants were then set out in 4 experimental fields in different parts of Belgium. The present article gives the detailed results of these tests, which in nearly all cases show that local seed produced plants with the greatest height, diameter, survival and volume. Characteristics of the parent trees are not given.—*H. T. Gisborne.*

7021. QUAIRIERE, C. J. Le Dilserbosch. [The Dilserbosch forest.] Bull. Soc. Centrale Forest. Belgique 30: 409-426. 1923.—Experimental plantations of resinous, broadleaved, and mixed species were made on an unfavorable soil, with various fertilizers applied by plots. The author presents the results and conclusions of examinations made in 1906 and 1921. Comments by E. DE M. are appended.—*H. T. Gisborne.*

7022. RATY, L. Debit des bois résineux. Rendement. [Production of the maximum quality of soft wood lumber.] Bull. Soc. Centrale Forest. Belgique 30: 495-500. 1923.—The relations between quantity and quality of lumber and factors such as fungus and insect injuries, shape and size of tree, kind of saw used, and kind of material cut, are described. A good saw and efficient sawing practice cannot produce high grade lumber unless silviculture has produced logs of high quality.—*H. T. Gisborne.*

7023. T[HO]MSON, J. A. [Rev. of: HUTCHINS, D. E. Waipoua kauri forest, its demarcation and management. 63 p. illus., 1 map. Lands and Survey Dept.: New Zealand, 1918.] New Zealand Jour. Sci. and Tech. 2: 223-224. 1919.

7024. THONET, ARM. La pinerie "Fontaine" à la commune de Hamoir. [The pine plantation of Fontaine.] Bull. Soc. Centrale Forest. Belgique 30: 434-437. 1923.—Growth of Austrian and Scotch pine in a $3\frac{1}{2}$ hectare plantation of 1859 is described. Measurements are given for 1908, 1919, and 1923. The Austrian pine proved superior.—*H. T. Gisborne.*

7025. WARD, G. A. A growing menace to our timber structures. New Zealand Jour. Sci. and Tech. 6: 12-15. 1 fig. 1923.—The white ant (*Calotermes brounii*) and its ravages in various timbers are described.—H. H. Allan.

7026. ZON, RAPHAEL. Forests and human life. Maine Nat. 2: 157-158. 1922.

7027. ZON, RAPHAEL, AND WILLIAM N. SPARHAWK. Forest resources of the world. Vol. I. xiv + 493 p. 9 maps; Vol. II. vii + 503 p. 7 maps. McGraw-Hill Book Co.: New York and London, 1923.

GENETICS

ORLAND E. WHITE, *Editor*

(See also in this issue Entries 6851, 6870, 6874, 6886, 6920, 6922, 6925, 7126, 7152, 7178, 7254, 7283, 7300, 7379, 7383, 7388)

7028. ALMQUIST, ERNST. Alexis Jordan und die Kleinarten. [Alexis Jordan and the microspecies.] Svensk. Bot. Tidskr. 17: 521-527. 1923.—The author summarizes his opinions on Jordan's work as follows: (1) He has discovered and described an enormous number of microspecies; (2) he has found an unexpected number of such species in certain Linnean species; (3) he has found such in species where no variation previously had been observed or had been supposed to exist; (4) he has found that the microspecies as a rule do not cross with one another; (5) he has analyzed all these forms by propagating offspring from a single individual.—O. Heilborn.

7029. BARNEY, A. F. The inheritance of smut resistance in crosses of certain varieties of oats. Jour. Amer. Soc. Agron. 16: 283-291. Illus. 1924.—The results concerning inheritance of resistance to *Ustilago avenae* in crosses of Fulghum × Black Mesdag, Swedish Select × Burt and Turkish Rustproof × Gold Rain are presented. The author interprets his results on the basis that resistance in the 1st cross depends upon 3 different factors; in the 2nd cross, upon 2 factors; and in the 3rd cross, on the basis of 1 factor.—In the 1st cross, both parents were highly resistant. In the 2nd cross, 1 parent was resistant and the other susceptible; in the 3rd cross, both parents were somewhat susceptible.—George M. Reed.

7030. BRUNSON, A. M. The inheritance of a lethal pale green seedling character in maize. Cornell Univ. Agric. Exp. Sta. Mem. 72. 22 p., 1 pl. 1924.—Pale green is a new lethal chlorophyll disorder in maize, the plants dying in the seedling stage. The character is a simple Mendelian recessive and the symbols Pg_1 pg_1 have been assigned to the factor pair involved. The evidence indicates that this new character is in the linkage group with the Raleurone factor, the probable order of the genes being $pg_1-r-g-l_1$.—J. H. Kempton.

7031. CH[ÉVALIER], A. [Rev. of: FOURNIER (PAUL). L'art de créer des races nouvelles. Principes de génétique. [Art of creating new races. Principles of genetics.] 1 broch. in 8°, 90 p. Paris, 5, rue de Bayard, 1921.] Rev. Bot. Appl. et Agric. Coloniale 2: 39. 1922.

7032. CHILD, C. M. The problem of pattern in organisms. Amer. Nat. 58: 115-126. 1924.—This paper is a short survey of the problem of organismic pattern which in the author's sense is the problem of organization and development. The chief attribute of pattern is physiological integration or unity brought about by transmissive (e.g., nerve impulse) and transportative (e.g., circulatory) correlating agencies. Several theories of the origin of pattern or integration are reviewed. The vitalistic conception of a metaphysical entity controlling development is rejected. Some preformistic theories represent an advance since they conceive the entity in physico-chemical terms but do not lead to a statement of the factors involved. Both vitalists and preformists neglect the part played by environment. An epigenetic viewpoint is finally adopted which recognizes the relation between protoplasm and environment as a prime factor in determining pattern and the problem on this view becomes a physiological problem, the solution of which depends on a physico-chemical statement and interpretation of the factors originating and controlling pattern. These factors are not inherent in the organism, hence transportative correlation between parts is not a fundamental cause of integration since it presupposes differentiation. Transmissive correlation in which the path of control leads from a region of original excitation by an external factor, which becomes temporarily physiologically dominant, is regarded as the "most general and most primitive factor" in pattern, and arguments in favor of this view are briefly listed.—L. C. Dunn.

7033. CLARK, T. BENNET. **Note on a seedling of *Cytisus adami*.** Trans. & Proc. Bot. Soc. Edinburgh 28: 84-86. 1922.—*C. adami* is a reputed graft hybrid originating in 1825 from a shield or bud of *C. purpureus* on a yellow Laburnum. The hybrid has pink flowers but often reverts to yellow. None of the pink flowers have been found fertile, but about 40 seeds from the yellow flowers were planted and one seedling has the narrow purple leaves of the hybrid type.—*L. R. Abrams.*

7034. CLELAND, R. E. **Chromosome arrangements during meiosis in certain *Oenotheras*.** Amer. Nat. 67: 562-566. *Illus.* 1923.—This is a brief account of certain meiotic stages in *O. franciscana sulfurea*, *O. biennis*, *O. biennis sulfurea*, *O. muricata* and *O. oblonga*. Late heterotypic prophase stages are characterized by a marked tendency on the part of the homologous chromosomes to become paired, a constant and definite arrangement of the chromosomes in the nucleus and the association of certain of the chromosomes end to end throughout the period in such a way as to form a closed circle. In the heterotypic metaphase the most noticeable feature is the regular way in which the chromosomes are arranged. Those that were attached together in circles or chains in late prophase are still attached; those that were separated into pairs remain separated. Contiguous chromosomes are attached to spindle fibres leading to opposite poles and alternate ones to fibres leading to the same pole. The regularity in the arrangement of chromosomes in metaphase suggests strongly that the chromosomes making up the circles have a definitely fixed position in these circles, and that they are placed there in such a way that homologous ones are separated to opposite poles. If that is the case, then the group as a whole constitutes a unit both structurally and in behavior, acting very much like a single chromosome pair. This would give a possible explanation for Shull's observation that most of the characters which he studied belong to the same linkage group.—*M. Demerec.*

7035. CREW, F. A. E. **Studies in intersexuality II. Sex reversal in the fowl.** Roy. Soc. (London) Proc. Ser. B 95: 256-278. 2 pl., 3 fig. 1923.—Eight cases are described of complete or partial sex reversal in the domestic fowl. In 1 case, a reproductively normal hen assumed ♂ characters and became the sire of 2 chicks. In some of the other cases the reversal reached the stage where normal reproductive cells of both ♂ and ♀ character were present. Other cases exhibited only partially the histological characters of the "acquired" sex. The hypothesis advanced is that permanence of the ♀ sex in the domestic fowl depends upon the presence of growing oocytes in the ovary. The ovary is successively invaded by sex cords derived from the peritoneum. Unless the inhibiting action of growing oocytes prevents it, there will be a transformation of these sex cords into testicular tissue.—*F. A. Hays.*

7036. DAHLGREN, K. V. OSSIAN. **Kreuzungsleinigkeiten. Versuche mit *Capsella bursa pastoris*, *Lactuca muralis*, *Fagopyrum emarginatum*, *Geranium Robertianum*, *Geum rivale*, *Dracocephalum thymiflorum* und *Nicandra physaloides*.** [Notes on crossing. Research with *Capsella bursa pastoris*, *Lactuca muralis*, *Fagopyrum emarginatum*, *Geranium Robertianum*, *Geum rivale*, *Dracocephalum thymiflorum* und *Nicandra physaloides*.] Hereditas 5: 222-230. 2 fig. 1924.—*Capsella Bursa pastoris* × *C. perhians* in F_2 gave a ratio of 238 normal fruits: 14 Heegeri type, indicating duplicate genes for triangular capsule shape. Heegeri individual × another undetermined *Capsella* gave a 15:1 ratio of normal fruited to Heegeri type. An F_2 Heegeri plant was heterozygous. The F_3 gave a 3:1 ratio. *Lactuca muralis* crossed with a *L. atropurpurea* form showed dark red to be recessive. A self-fertilized, short-styled *Fagopyrum emarginatum* plant produced 10 similarly short styled plants. Further plantings gave 118 short-styled: 30 long-styled plants, showing the original plant to have been heterozygous. References are made to investigations on different style lengths in 1923 by Laibach, Stout, Barlow and von Ubisch. Crossing red and leucanthum forms of *Geranium Robertianum* showed F_1 to be red. The F_2 gave 26 red: 8 white, or a monohybrid ratio. *Geum rivale* crossed to *G. pallidum*, a near variety lacking anthocyanin, produced a red-brown F_1 . The F_2 gave monohybrid segregation. *Dracocephalum thymiflorum* crossed to a *D. pallida* variety produced an F_1 much like the normal. The F_2 gave a monohybrid segregation, 2294:764. An immaculata form × typica of *Nicandra physaloides* showed dominance of the latter in F_1 . The F_2 gave a fairly good monohybrid segregation.—*Helen D. Hill.*

7037. DAHLGREN, K. V. OSSIAN. Vererbungsversuche mit *Polemonium coeruleum*. [Experiments on the heredity of *Polemonium coeruleum*.] *Hereditas* 5: 17-28. 6 pl. 1924.—The F_2 data presented in this paper support the conclusion that dissected leaves act as a simple Mendelian recessive to normal leaves, white flowers to blue, small and narrow petals to normal, and lethal pale green seedlings of chlorina type to green seedlings.—*M. Demerec*.

7038. DAVENPORT, C. B., AND L. C. CRAYTOR. Comparative social traits of various races, second study. *Jour. Appl. Psych.* 7: 127-134. 1923.—One hundred and two children from Germany, Ireland, Italy, Austria and Russia were each rated by 1 to 3 teachers on 10 traits: 1, leadership; 2, pertinacity; 3, humor; 4, frankness; 5, suspiciousness; 6, sympathy; 7, loyalty; 8, generosity; 9, obtrusiveness; and 10, coolness. Germans were high in 1, 2, 3, 4, 6, and 7 and low in 5. The Irish were placed in the upper group in 3, 5, 7, and 8 and in the low groups of 1, 2, 4, and 6. Italians were high in 7, and 8 and low in 1 and 3. Jews were high in 2, 5, 8, and 9 and low in 1 and 3.—*Robert T. Hance*.

7039. DUNCKER, H. Einige Beobachtungen über die Vererbung der weissen Farbe bei Kanarienvögeln. [Some observations on the inheritance of white color in canaries.] *Zeitschr. Indukt. Abstamm. u. Vererb.* 32: 363-376. 1924.—White body color in the canary does not represent true albinism but rather the restriction of pigment largely to the eyes. Crosses of white \times white, white \times yellow and yellow \times yellow show white to be epistatic to yellow. Homozygous whites die early because of the linkage of the white-producing gene to a lethal gene. All white birds represent heterozygotes and make the establishment of a true-breeding white variety impossible. The average size of brood from white \times white matings was less than that from either of the other 2 types of matings because of the loss of the homozygous whites.—*F. A. Hays*.

7040. DUNN, L. C. Color inheritance in fowls. *Jour. Heredity* 14: 23-32. 4 fig. 1923.—The buff and Columbian colorations of fowls appear to differ in 1 principal gene (E^m) determining the presence or absence of buff in the plumage and probably in multiple factors determining the amount of black developed in wing, tail and hackle feathers. Buff and Columbian differ from black by a gene (e^m) determining the restriction of black to hackle, tail and wing. Its dominant allelomorph (E^m) which is present in self black, determines the extension of black to all parts of the plumage. Black fowls are genetically buffs with the extension factor superposed. When the sex-linked gene (S) for silver is present in a black or "extended" fowl it "shows through" in a pattern determined possibly in part by the residual heredity of the black or by pattern factors contributed by another variety. The appearance of fowls which have both extension and silver make it seem probable that the Dark Brahma variety will be found to be of the genotype $E^m E^m SS$. Although in the present types, black and Columbian, the plumage is alike in both sexes, in the 1st and later generations sexual dimorphism appeared in the dark (extended) fowls. This may possibly be traced to a recombination of pattern and extension factors, which reacts to the sexual hormones in a manner different from either parental combination.—*F. A. Hays*.

7041. DÜRKEN, BERNHARD. Über die Wirkung farbigen Lichtes auf die Puppen des Kohlweisslings (*Pieris brassicae*) und das Verhalten der Nachkommen. Ein Beitrag zur Frage der somatischen Induktion. [The effect of colored lights on the pupae of cabbage butterflies (*Pieris brassicae*) and their reaction upon the offspring. A contribution to the question of somatic induction.] *Arch. Mikrosk. Anat. Entwicklungsmech.* 99: 222-389. 9 fig. 1923.—The author's breeding methods are fully described, including details of behavior of butterflies in mating. Egg-laying occurs chiefly during the latter half of adult life. Elimination of supernumerary individuals in the population is largely non-selective, e.g., infection by *Microgaster*, or sterility ascribed to environmental conditions (position of the chrysalis) forcing ahead general pupal development faster than the germ cells can mature. The butterflies in cages on a housetop were, however, frequently attacked by birds, and had to be protected by a double netting. No sexual selection was observed. Pupation in darkness slightly reduces the amount of black pigment in the pupa. Pupation in orange or red light (not red background) strongly reduces black and white, and greatly increases yellow-green, pigmentation. Blue light slightly weakens pigmentation. This differential action to light takes place in the larval rest period just before pupation, not earlier. Colors of the imago are not modified by exposure of the larva or pupa to red, orange, or blue light or to darkness; in fact, pigmentation

of the imago is independent of the coloration of the pupa. Individual details in black markings of the wings vary independently of one another. Acquired pupal green is highly inheritable, not by direct action of orange and red light on the germ cells but by hologenic somatic induction, i.e., by the action of light upon the surface of the body and on the haemolymph. This hereditary effect is the same whether the parent merely pupates in orange-colored light or passes its whole larval and pupal life in such light. Acquired black-white pigmentation is subject to the same sort of inheritance as green. Supplementary to Prell's "somation" (non-inheritable somatic modification), Dürken uses "degression," in a new sense (not that of de Vries), meaning an easily modifiable, *plasmogenetically* inheritable change induced by environmental factors acting upon the parental soma.—*J. H. Gerould.*

7042. EMERSON, R. A. **Aberrant endosperm development as a means of distinguishing linkage groups in maize.** *Amer. Nat.* 58: 272-277. 1924.—Mosaic seeds in maize are assumed to be the result of aberrant chromosome behavior such as nondisjunction. Having established the probability of this assumption for the 2 linkage groups *C* and *Y*, an extension of the hypothesis to mosaic seeds involving other endosperm characters affords evidence that the *C*, *Su*, *Y*, *R* and *A* linkage groups are distinct. The data indicate also that the *Pr pr* factor pair does not belong to either the *C*, *Su* or *A* groups, and there is some evidence that it does not belong to either the *Y* or the *R* groups.—*J. H. Kempton.*

7043. ENGLEADOW, F. L., AND S. M. WADHAM. **Investigations on yield in the cereals.** *Jour. Agric. Sci.* 13: 390-439. 1 *pl.*, 2 *fig.* 1923.—The production of high-yielding forms of cereals is arrested by a lack of knowledge of the cereal plant. Two high-yielding pure-line varieties of barley, Plumage and Archer, were selected for a careful statistical study. Notes were taken on various characters which could be readily studied. The method used was that of a thorough general reconnaissance of the characters of the plants of these 2 varieties. The studies included a comparison of the characters of the 1st, 2nd, etc., formed tillers, length of lemma of the 1st green leaf, and root, ear and grain characters. A rather marked correlation was noted between weight of individual awns and corresponding grains, although the results indicated that grain development is only partially and conditionally dependent upon size of awn. [See also following Entry.]—*H. K. Hayes.*

7044. ENGLEADOW, F. L., AND S. M. WADHAM. **Investigations on yield in the cereals.** Part II (contd.). *Jour. Agric. Sci.* 14: 66-98. 1924.—One purpose of this study was to explore the possibilities of making accurate determinations of tillering. Time of flowering and weight of grain and straw were also studied for individual tillers. Care was taken to select and sow seeds of uniform size in a similar manner. End plants of rows, all plants of end rows, plants not surrounded by other plants and those which did not germinate on the modal day for the variety were discarded. The results obtained indicate that the methods employed were of value. [See also preceding Entry.]—*H. K. Hayes.*

7045. ENOMOTO, NAKAE. **Studies on an ever-segregating race in *Portulaca grandiflora*.** *Japanese Jour. Bot.* 1: 137-151. 1923.—The author has a "special white" race of *Portulaca* which differs from the normal whites by having reddish pigment in leaves, stem, base of petals, filaments and styles. Special whites are heterozygous and when selfed throw about 2 special whites to 1 normal. Thus, 26 special white parents gave 65% special whites and 35% normal whites in a total of 2604 offspring. The special whites always segregate while their normal white sibs breed true. A back cross of special white to a green-stemmed type gave 47% special whites to 53% green-stemmed. From selfing and from back-crossing, the recessives are slightly in excess of the theoretical 1:1 ratio. Differential mortality (17% among special white as against 4% among normal white seedlings) is suggested as the explanation. High sterility of seed in special whites (24.7% abortive ovules with over 2000 seeds counted out, against 1% for normals) is further evidence in support of the hypothesis that the special whites are heterozygous for a factor which is lethal when present in a double dose.—*A. F. Blakeslee.*

7046. FELL, H. B. **A histological study of the testis in cases of pseudointersexuality and cryptorchism with special reference to the interstitial cells.** *Quart. Jour. Exp. Physiol.* 13: 145-158. 6 *pl.* 1923.—Two pigs, 5 horses, a cat and a rabbit studied histologically, showed hyperplasia and degeneration, the extent depending upon: (a) the metabolic condition of the individual. In inactive individuals the cells finally undergo hypertrophy owing to the accumulation of food material in the cytoplasm. This is followed by secretory inactivity resulting

in intersexual, secondary sexual characters. In active animals the food reserve in the body will be heavily taxed and nutritive material destined for an organ which no longer functions will tend to be reabsorbed and utilized elsewhere. The Leydig cells will receive little more than is requisite for their own needs, hyperplasia will be corresponding slight and their endocrine activity will be unimpaired. (b) The degree of degeneration of the seminal epithelium. Data were insufficient to solve the problem of pseudointersexuality.—*Robert T. Hance.*

7047. FELL, H. B. **Histological studies on the gonads of the fowl. I. The histological basis of sex reversal.** *British Jour. Exp. Biol.* 1: 97-130. 3 pl. 1923.—Eight birds were studied. In every case the development of testicular tissue was preceded by ovarian atrophy or disease. In 2 birds a small testis was found on the right side. Some evidence is found for the belief that luteal cells control the female type of plumage. The problem of the origin of germ cells is reviewed and in the cases at hand it was thought that the newly formed gametocytes were of peritoneal origin.—*Robert T. Hance.*

7048. FETSCHER, R. **Zur Frage der Knabenziffer beim Menschen.** [The boy-ratio in human beings.] *Arch. Rass.- u. Ges. Biol.* 15: 233-249. 1924.—A tendency toward a higher boy ratio exists, which is probably inherited. This is contrary to the equal sex ratios of the gametes at the end of maturation and there is some evidence cited which may indicate that the age of the mother has some effect. The influence of the father has not been demonstrated. An extensive bibliography is included.—*Robert T. Hance.*

7049. FOX, H. MUNRO. **Note on Kammerer's experiments with *Ciona* concerning the inheritance of an acquired character.** *Jour. Genetics* 14: 89-91. 1 pl. 1924.—This article gives in more detail the results of experiments previously reported [see *Bot. Absts.* 13, Entry 5019]. It is also stated here that even when both siphons were amputated, those regenerated were of normal length.—*L. R. Waldron.*

7050. GEROME, J. **Transformations d'une inflorescence male de Mais en inflorescence partiellement femelle, sans l'intervention de traumatismes ou de Champignons parasites.** [Transformation of a male inflorescence of maize to a partial female inflorescence without wounding or fungous parasitism.] *Jour. Soc. Nation. Hort. France* 23: 441-442. 1922.—A plant of a Spanish variety of maize grown in France produced a sucker which bore fertile female spikelets on a terminal inflorescence.—*J. H. Kempton.*

7051. GEROULD, JOHN H. **Inheritance of white wing color, a sex-limited (sex-controlled) variation in yellow Pierid butterflies.** *Genetics* 8: 495-551. 1923.—In *Colias philodice* and in *C. eurytheme* there are 2 types of female, 1 yellow, like all males, and 1 less common which is white. The male-like type is recessive, which is true in other polymorphic butterflies (*Papilio*, *Argynnis*). Wild white (dominant) females invariably have proved to be heterozygous. When white females comprise 10% of the female population, heterozygotes are 38 times as numerous as homozygotes. Tables are given for the relative abundance of the 2 white biotypes, as the relative proportions of white to yellow individuals vary in different localities.—Females are *WW*, *Ww* (white), or *ww* (yellow). Males, though yellow, are either *WW*, *Ww*, or *ww* for female coloration. One seldom gets the 3:1 ratio from *Ww* × *Ww*—all-white families are frequently the result. Moreover, clear-cut examples of a 2 white:1 yellow ratio were obtained from *Ww* × *ww*, both when the female and when the male was the heterozygote. These facts are explicable by the assumption of an interacting recessive lethal factor closely linked with yellow, which is clearly brought out by following a lethal-bearing strain through 3 generations. Similar irregular ratios, similarly explained, were observed in both species and in hybrids between them. Data from T. E. Bean for *C. christina* in Alberta and from Pieszczyk for *C. myrmidone* in Austria show that in these species white female coloration is inherited substantially as in *C. philodice* and *C. eurytheme*. Distribution of the white variety in Austria follows climate (altitude). Homozygous whites are common at high altitudes where yellow females are relatively rare; at lower altitudes where the female population is 78 % yellow, heterozygous white females prevail; on the great plains to the north and west, all or nearly all females are of the recessive yellow type. Distribution of the white in *C. philodice* and *C. eurytheme* does not follow altitude and latitude, but arctic species of *Colias* in several cases have only white females, e.g., *C. scudderi*, *C. pelidne*. The dominant white type in general is probably the original from which the recessive male-like type has sprung.—In comparing sex-controlled heredity in *Colias* and *Papilio* the theory of protective mimicry is discussed and

criticized. No evidence is found that natural selection of protected variations has occurred in the phylogeny of either genus. Simple genetic changes account for the polymorphism.—Precocity of the male in *Colias*, due to its greater velocity of development, is compared with differential velocity in other insects, e.g., the bee, in which the drone develops more slowly than the queen. Hybridization between *C. eurytheme* and *C. philodice* sometimes upsets the normal sex ratio and male precocity. The suggestion is made that in certain hybrid pigeons described by Riddle precocious development of the male-becoming eggs would produce in spring and summer "nearly all males." If eggs should escape with continuous regularity, the female being "overworked at egg production," she would produce in the autumn "all, or nearly all, female offspring," but Riddle's published data do not well support the hypothesis of male precocity in pigeons.—*Author*.

7052. GOODSPEED, THOMAS H. A preliminary note on the cytology of *Nicotiana* species and hybrids. *Svensk Bot. Tidskr.* 17: 472-478. *Fig.* 1-2. 1923.—The following list of chromosome numbers is given: $X = 9$ in *N. Langsdorffii*; 8, 9, or 10 in *N. alata*; 10 in *N. longiflora*; 12 in *N. sylvestris*, *N. glauca*, *N. glutinosa*, *N. paniculata* and *N. acuminata*; 18 in *N. suaveolens* and 24 in *N. Tabacum*, *N. rustica*, *N. Bigelowii* and *N. nudicaulis*. In *N. alata* there are generally 9 chromosomes in all 4 homotypic anaphases, but sometimes one finds 2 plates with 10 and 2 with 8, or 2 with 10 and 2 with 9 chromosomes. This depends upon the lack of conjugation of 2 chromosomes, sometimes accompanied by longitudinal division of one of them. In this way 10-chromosome species might arise out of 9-chromosome species. The F_1 generation of the hybrid, *N. sylvestris* \times *N. Tabacum*, is investigated cytologically. It has 36 somatic chromosomes, and in meiosis 12 bivalents and 12 univalents are found. The partners of the bivalents 1st separate, later the univalents divide without, however, arranging themselves in the equatorial region; a few chromosomes lag behind, however, and are lost in the plasma. The number of chromosomes appearing in a homotypic metaphase is rarely less than 19 or 20. Diads sometimes result from the abnormal growth of nuclei in interkinesis, which do not later divide. In some cases the 2-homotypic spindles unite to produce a monstrous but regularly arranged metaphase. The pollen tetrads have a normal appearance but later the pollen-grains degenerate. It is suggested that extracted *sylvestris* and *Tabacum* plants obtained from back-crosses with *N. sylvestris* and *N. Tabacum*, have arisen from hybrid embryo-sacs, matured with the pure set of 12 *sylvestris* and, 24 *Tabacum* chromosomes respectively. Work is still in progress.—*O. Heilborn*.

7053. GRIFFEE, F. Breeding oats resistant to stem rust. *Jour. Heredity* 13: 187-190. 3 *fig.* 1922.—The method used at the Minnesota Experiment Station for differentiating heterozygous and homozygous F_2 plants in breeding for rust resistance when resistance is a dominant character, is to grow in the greenhouse F_3 seedling families from each resistant F_2 plant. These seedlings are inoculated with rust, and from their reaction the F_2 plants which are homozygous for resistance are determined. In breeding oats resistant to stem rust, 192 of the 567 F_3 families thus tested bred true for resistance, thereby reducing accordingly the number of lines to be grown in the field the following season.—The brushing method, in which the seedlings are sprayed with water and then brushed with rusted seedlings, was highly satisfactory for producing inoculum and may be used as a means of inoculating hybrid families when the manner of reaction allows the segregation to be easily determined.—*Author*.

7054. HALLQUIST, CARL. Chlorophyllmutaten bei Gerste. Ihre Entstehung und primären Spaltungen. (Chlorophyll mutations in barley. Their origin and primary segregation.) *Hereditas* 5: 49-83. 7 *fig.* 1924.—Several recessive types of barley arose by mutation. All proved to be simple mendelian characters. When a very small percentage of the initial segregation consists of mutants and only 1 heterozygote is found in the progeny test of sister plants, the mutation may with great certainty be called gametic. When, however, several heterozygotes are found in the progeny test of sister plants, the mother plant was partly heterozygous and the mutation may be called vegetative. Baur states that in some cases a vegetative mutation may have occurred in a very small part of the grandmother plant; hence, one cannot tell with certainty the origin of the mutant. Thus the origin of those mutants which 1st appear in a mendelian segregation cannot be known.—Four albino mutants were observed. *Albinos* 3 and 4 arose through vegetative mutation, *albino* 6 through gametic mutation, and *albino* 5 1st appeared in a mendelian segregation, hence, its origin is not known.—

One xantha type (*xantha* 2) was studied. The results do not disclose its origin, though it was probably vegetative.—Two types of *lutescens* plants occurred. *Lutescens* 1 arose through gametic mutation. The origin of *lutescens* 2 is not known since it occurred in a mendelian segregation.—Three *virescent* characters were reported but whether they arose through gametic or vegetative mutation is uncertain. The same is true of 1 *superchlorina* type and 2 types of dwarf, *dwarf* 1 and *dwarf* 2 or *linearis*.—W. A. Carver.

7055. HANCE, ROBERT T. The somatic chromosomes of the chick and their possible sex relations. *Science* 59: 424-425. 1924.—The chromosome number in the chick probably lies between 35 and 40, it being very difficult to determine the exact number, owing to the minute size of the smallest chromosomes. A study of chromosome size and form shows that in cells of ♀ origin the largest chromosome is unpaired while in the ♂ the corresponding chromosome is duplicated. This indicates a possible mechanism in harmony with the known genetic heterozygosity of the female. Corroborative evidence is drawn from figures by Miss Stevens. Conclusive proof must await a study of adult testes, which is delayed owing to the apparent mitotic inactivity of the gonads at this time of year.—Author.

7056. HARRINGTON, J. B. Methods of keeping records of cereal breeding investigations. *Proc. Canadian Soc. Agron.* 1922: 78-85. 1922.—The method of keeping records of cereal breeding experiments used by the Minnesota Agricultural Experiment Station is described in detail. Methods used by other stations in Canada and U. S. A. are compared with the Minnesota system.—H. K. Hayes.

7057. HARRIS, J. A., Z. W. LAWRENCE, W. F. HOFFMAN, J. V. LAWRENCE, AND A. T. VAL-ENTINE. The tissue fluids of Egyptian and Upland cottons and their F₁ hybrid. *Jour. Agric. Res.* 27: 267-328. 1 pl. 1924.—The physico-chemical properties of the leaf tissue fluids were investigated in 2 very distinct species of *Gossypium*, one represented by Egyptian cotton (Pima variety) the other by Upland cotton (Acala and Meade varieties). On irrigated land in Arizona, with the 2 types growing under identical conditions of environment, Egyptian proved to be significantly superior to Upland cotton in osmotic concentration, specific electrical conductivity and H-ion concentration of the expressed leaf sap. First generation hybrids between these species, which exhibit marked heterosis in size characters, showed a lower osmotic concentration and specific electrical conductivity than did either parent, while in H-ion concentration the hybrids were intermediate.—T. H. Kearney.

7058. HERWERDEN, M. A. VAN. [Dutch rev. of: WASSINK, W. F. EN C. PH. WASSINK-VAN RAAMSDONK. *Erfelijkheid van Kanker. (Inheritance of cancer.)* *Nederlandsch Tijdschrift van Geneeskunde* 2: 326. 1923.] *Genetica* 5: 532-533. 1924.

7059. HIORIH, GUNNAR. Die ungleiche Bewegungsgeschwindigkeit der Spermatozoen als Ursache der Verbreitung krankhafter Anlagen. (The unequal speed of spermatozoa as the cause of spreading diseased germ-plasm.) *Arch. Rass.- u. Ges. Biol.* 15: 270-273. 1924.—The possibility of unequal speed of sperms as the cause of transmission of various characters is considered, although the author admits that, so far, the discussion is purely theoretical.—Robert T. Hance.

7060. HUXLEY, JULIAN S. The function of the Mendelian genes. *Nature* 111: 286-287. 1923.—Controversial correspondence is given, in which the author quotes from E. W. MacBride's review of Reinke's work. The author objects to MacBride's conception of 'gene' as 'mutant gene' only and to his treating it as a pathological condition. He contends that for every 'mutant gene' discovered there is an allelomorphic normal gene and that 'mutant genes' may be pathological or not. He reviews the modern conception of the 'Physical basis of heredity' and cites example of inheritance of 'agouti' and the lethal 'yellow' in mice. Calculations of the number of genes in *Drosophila* indicate "certainly more than 1000, probably more than 2000, certainly less than 20,000." The author states there is little room or need for other mechanisms of heredity and he believes that all higher animals and plants possess chromosome gene complexes similar to *Drosophila*.—J. Ben Hill.

7061. HUXLEY, J. S. Mendelism in evolution. [Rev. of: MORGAN, T. H., A. H. STURTEVANT, H. J. MULLER AND C. B. BRIDGES. *The Mechanism of Mendelian Heredity.* *Rev. ed.*, xiv + 357 p. Henry Holt and Co.: New York; Constable and Co.: London, 1923 (see *Bot. Absts.* 13, Entry 1588).] *Nature* 113: 518-520. 1924.

7062. JENKIN, T. J. The artificial hybridization of grasses. Bull. Welsh Plant Breeding Sta. Ser. H, 2. 18 p. 1924.—The author describes his methods for cross-pollinating several different grasses, with a view to improving them through hybridization. For the most part the crosses were made between different individuals of the same species. Successful results, however, were obtained between *Lolium perenne* and *Festuca rubra*; and between *Lolium perenne* and varieties of *Festuca elatior*. No studies are reported on the resulting hybrids.—George M. Reed.

7063. JOHANNSEN, W. Inheritance of characters acquired by grafting. Nature 113: 536. 1924.—Reference is made to an article by L. Daniel [Compt. Rend. Acad. Sci. Paris 177: 1449-1452. 1923]. The differences cited are regarded as due to the heterozygous nature of the scion. "The great bulk of indications claimed as cases of alleged inheritance of acquired characters show an astonishing lack as to critical judgment."—O. A. Stevens.

7064. JORDAN, DAVID STARR. [REV. OF: HOLMES, SAMUEL J. A bibliography of eugenics. Univ. California Publ. Zoology 25: 1-514. 1924 (see Bot. Absts. 13, Entry 6560).] Science 59: 362. 1924.

7065. KAJANUS, BIRGER. Genetische Studien an Pisum. (Genetic studies on Pisum). Zeitschr. Pflanzenzücht. 9: 1-22. 1923.—Studies herein reported deal with the inheritance of seed and flower color, character of leaf bases and variegation. For flower and seed color, 7 factors, *R*, *G*, *Z*, *P*, *O*, *M*, and *S* are assumed. The interactions of these factors are described in detail.—Wrinkled seeds are believed to be due to the simultaneous presence of *R*, *G*, and *Z*; if any one of these is lacking the seeds are round. By modification, genetically smooth seeds show pseudo wrinkling and genetically wrinkled seeds become smooth.—Only green plants appeared in F_1 and F_2 of green pollinated by yellow variegated. Variegation is transmitted through the egg only.—A formula is derived from which the amount of foreign pollination can be calculated.—F. W. Hofmann.

7066. KAJANUS, BIRGER. Über die Fertilität in Kreuzungen zwischen verschiedenen Weizenarten. [Fertility of crosses between different varieties of wheat.] Hereditas 4: 341-350. 1923.—In a cross of *Triticum vulgare* and *T. turgidum* the F_1 plant had an average grain content of 2.36 per spikelet, about equal to that of the *turgidum* parent variety which had 2.39, and less than the *T. vulgare* parent with an average of 2.04. The F_2 plants showed averages generally less than the *T. vulgare* parent; fertility of individual plants was nearly zero. Averages of F_3 plants varied from 1.63 of *turgidum-durum* type of 2.97 of *speltoid* type. A correlation probably existed between fertility of the F_2 and F_3 families. Sterility probably depends not alone upon difference in number of chromosomes but also upon physiological plant differences.—L. R. Waldron.

7067. KEMPTON, J. H. Inheritance of the crinkly, ramose, and brachytic characters of maize in hybrids with teosinte. Jour. Agric. Res. 27: 537-596. 8 pl. 1924.—An analysis is given of the inheritance of 3 mendelian characters of maize—crinkly, ramose and brachytic in hybrids with annual teosinte, *Euchlaena mexicana*. As in hybrids with normal maize all 3 variations are recessive in the hybrid with teosinte. In the F_2 the crinkly and ramose characters reappear in 25% of the plants but the brachytic character is found in only 12% of the progeny.—All 3 characters are found to be correlated with other characters of maize but in many cases the characters involved differ in the 3 hybrids. It seems clear that many of the multiple-factor characters of maize are correlated with these 3 simple characters but the characters involved and the degree of closeness of their relations differ in the 3 hybrids.—The combination of the teosinte form of pistillate inflorescence with the branched condition of ramose was completely sterile, and there seems to be little reason to believe that such a combination represents an ancestral form.—With respect to correlations among characters which differentiate maize and teosinte, but which are not involved in the change from normal maize to the 3 variations studied, there seems to be practically complete freedom of recombination within the limits of physiological relationship.—Author.

7068. Козо-Полянский, В. М. [KOZOT-POLJANSKI, B. M.] Последнее слово антидарвинизма. [The last word of anti-Darwinism.] vi + 136 p. Вуравестник: Краснодар [Burevestnik: Krasnodar, Caucasus], 1923.—The author gives a detailed historical and critical analysis of the theory of nomogenesis, published in 1922 by Berg in Petrograd. This theory is a modification of Owen's hypothesis of derivative law and Naegeli's perfection theory; it seems

to attempt to introduce theology and mysticism into biology, and might be more properly called thaumatogenesis. The author affirms that the theory of selection represents the sole seriously confirmed doctrine capable of explaining the origin of "perfection" in the organic world.—*B. Kozot-Poljanski.*

7069. KRISTOFFERSON, KARL B. Colour inheritance in the seed coat of *Phaseolus vulgaris*. *Hereditas* 5: 33-43. 1924.—Within an old Swedish variety of asparagus bean, "*Steninge Hybrid*", a diversity in seed coat color was found. Progeny tests showed that seeds of a black color breed true, likewise those described as steel colored on a brown background. A 3rd type of seed mottled black and brown, showed a rough approximation to a 1:2:1 ratio for black, mottled and steel colored respectively. Intensity of steel color varied presumably because of modifying factors. The author attributes black color to a gene *K* and steel color to its absence. From another line of observation the progeny of double-mottled seeds is described as comprising 4 phenotypes. A criticism of the confused nomenclature of seedcoat genetics for beans is given.—*J. P. Kelly.*

7070. KRISTOFFERSON, KARL B. Monohybrid segregation in *Malva* species. *Hereditas* 4: 44-54. 4 fig. 1923.—The author reports that species crossing of *Malva oxyloba* and *M. parviflora* gives a fertile F_1 hybrid generation with reciprocal crossings identical and a simple type of segregation in the F_2 generation. The differences between the parent species pertained to leaf lobes and sepal shapes. He thinks that the 2 species should be united into one.—*J. P. Kelly.*

7071. LIPPINCOTT, W. A. The hereditary relation of dominant white and blue in chickens. *Poultry Science* 2: 141-145. 1923.—Results of crosses are reported to show that the gene for dominant white (*I*) in the White Leghorn and the genes for blue (*Re* and *rE*) of the Andalusian segregate independently.—*F. A. Hays.*

7072. LOTSY, J. P. Current theories of evolution. *Genetica* 4: 385-416. 1922.—The author distinguishes between the terms diversity and variation. Observation of differences indicates diversity in organisms. He cites the supposed variation in *Parthenium argentatum* investigated by Macallum; the types bred constant, indicating diversity but not variation. Diversity is observed but variation as the cause of diversity is revealed only by experimental study. All conclusions as to phylogenetic origin, continuous variations, and orthogenesis based upon observation as in the case of fossils are mere speculations. Feathers of pheasants, *Gennaeus argentatus*, *G. lineatus*, and *G. Horsfieldii*, are cited showing a fine series of intermediates arising not by variation but by hybridization. The work of Linnaeus, Lamarck, Darwin, and even Bateson tends to confuse diversity with variation, indicating that variation could be observed. Alexis Jordan first demonstrated pure lines in *Draba verna*, composed of over 300 distinct constant types; but transmittable variation had become a dogma and Jordan's work was disregarded. Actual mutations in *Oenothera* and *Drosophila* have not been proved but have been readily accepted because of the desire to see transmittable variability. The author believes *Drosophila melanogaster*, like *Oenothera Lamarckiana*, to be impure stock since mutations arise chiefly in wild stock. Such mutations are of no evolutionary value.—Hybridization. Mendel proved that variability was caused directly by hybridization. His work, though known to Focke, Galton, Kerner, and Nägeli, was disregarded because expressed in mathematical terms, because of lack of knowledge of chromosomes, because of belief in the constancy of species hybrids, and because Mendel was not a biologist. Constancy in Nägeli's *Hieracia* hybrids was due to apogamy. Mendelian segregation can apply only to hybrids between forms whose chromosome number is equal. Members of the *Roseae*, according to Täckholm, Miss Blackburn, and Harrison are often hybrids whose parents had unequal chromosome numbers. *Rosa canina* has 35 chromosomes (7 disomes and 21 singles). The viability of pollen depends on chromosome number. Self-fertilization is rare in the *Roseae*, the races being conserved apomictally. There is some possibility of segregation in *Rosae*, depending upon the separation of disomes at reduction followed by rare self-fertilization. Van Overeem shows segregation simulated in triploid semi-gigas forms of *Oenothera* due to unequal chromosome distribution. Bremer describes sugar cane hybrids (136 chromosomes) *Saccharum officinarum* (40 chromosomes) \times *Saccharum spontaneum* (56 chromosomes). The number in the hybrid is caused by splitting of the 40 *officinarum* chromosomes. Fifty-six of these pair with the 56 *spontaneum* chromosomes and the remaining 24 pair with each other resulting in 56 hybrid

disomes and 12 pseudo-hybrid disomes in zygote. This tends to confirm Winge's hypothesis of the derivation of chromosome numbers in species by crossing, which, if true, emphasizes the role of hybridization in evolution (Diagram of Winge's hypothetical process). *Drosophila* and *Datura stramonium* favor Winge's hypothesis with chromosomes sufficiently different to suggest derivation from diverse sources. Even a pure line may show hybridity in the diverse origin of chromosomes.—Cause of Evolution.—The author dismisses the idea of transmissible variability as untenable, and regards all variability as a manifestation of segregation induced by hybridization. Correns, with *Mirabilis*, Baur and the author working with *Antirrhinum* showed segregation in species hybrids and that species and varieties cannot be distinguished by crossing. The author's theory of evolution by means of hybridization is based upon studies of the remarkable F_2 segregation in *Antirrhinum majus* \times *Antirrhinum glutinosum*. He considers polymorphy in *Oenothera*, *Draba verna*, *Viola*, *Helianthemum*, *Rubus*, *Hieracium*, *Rosa* and *Salix* due to hybridization and not to mutation as de Vries predicted. *Cacti* show evidences of hybrid origin. MacDougal shows that *Cacti* species-hybrids segregate, and found certain *Echinocerei* too heterozygous for experimental work. Thornber and MacDougal state that wild *Cacti* hybrids occur in nature. Diversity of *Opuntia versicolor* suggests heterozygosity. Asexually multiplied, cultivated plants show clearly their hybrid origin when sexual reproduction occurs. Houwink shows domestic fowls to have arisen from *Gallus bankiva*, *Gallus Sonnerati* and *Gallus furcatus*. Ghigi shows *Columba livia* and *Columba leuconota* to have taken part in the formation of the domestic pigeon. Natural species-hybrids occur among animals. The objections to the author's theory are (1) mutations in asexually multiplying organisms such as pure cultures for fungi and bacteria; (2) how a higher form could arise from crossing 2 lower forms and (3) explanation of the origin of the 1st diversity. Brierley considers "mutations of multinucleated fungi such as *Botrytis* as possible segregations," doubting the purity of such forms. Even with our present limited knowledge of *Bacteria*, *Protozoa* and *Flagellates* there is a possibility of sexual reproduction in them and some evidence of hybridization. The author believes that diversity of life has existed from its 1st origin, and regards the idea of a single "urplasm" as a survival of the creation myth. The author with Conklin and Loeb regards cytoplasm as the determinant of phyla; chromosome sets, changed continuously by hybridization, the differentials of species. He cites Scott, representing the paleontologists' idea of the very remote origin of phyla. The assumption of a polyphyletic origin of diversity does not necessitate the idea of initial cytoplasm for each phylum. Cytoplasmic hybridization similar to nuclear hybridization is reasonable as a speculation. The author answers Bateson's statement at the Toronto meeting that "the origin of a species might be discovered," by citing the example of *Antirrhinum rhinanthoides* as a new species arising by hybridization. He also regards many domestic races of animals as actual species and regards as obsolete, the species concept with its doctrine of immutability and species hybrid sterility. As diversity arises through chemical combination in the inorganic, it follows from hybridization in the living world.—J. Ben Hill.

7073. MACBRIDE, E. W. Experiments on *Ciona intestinalis*. *Nature* 113: 196. 1924.—A letter from Kammerer to MacBride states that results secured by the former on *Ciona* took place only when both siphons were amputated. It is suggested that failures by Fox [see Bot. Absts. 13, Entry 5019] are due to his use of a northern race of *Ciona*.—L. R. Waldron.

7074. McCLELLAND, T. B., T. BREGGER, W. P. SNYDER, J. A. SALDANA, AND H. C. HENDRICKSEN. Horticultural investigations at the Porto Rico Station, 1922. Porto Rico Sta. Rept. 1922. 5-8, 10-13, 15, 16. 1 pl., 4 fig. 1922.—On beans, blackness of seed coat is reported dominant over whiteness and glossiness is dominant over dullness. In egg plants the F_1 hybrid of *New York Improved* and the native striped *Pompona* proved intermediate in size and shape; the color was purple with underlying *Pompona* pattern near the apex. In self-pollinated strains of corn (also in open-pollinated) abnormalities are reported. In tomatoes and bananas selections for disease resistance showed some promise.—J. P. Kelly.

7075. Манстер, Г. [MEISTER, G.] Опыт изучения межвидового скрещивания *Тriticum durum* Desf. \times *Тriticum vulgare* Vill. [An experiment in studying a cross between distinct species, *Triticum durum* Desf. \times *Triticum vulgare* Vill.] Жур. Опжыт. Агрон. Югосток. [Jour. Exp. Agric. Southeast] 1: 49-72. 1922 [Summary in English].—Several constant hybrids were obtained from a cross, made in 1912, at the Saratoff Experiment Station,

between *Triticum durum* v. *hordeiforme* and several varieties of *T. vulgare*. Among others, beardless forms of *T. durum* were obtained, these giving straw better suited for feeding purposes than ordinary bearded durum wheats. Natural crossing between *T. durum* and *T. vulgare* is common in southeast Russia, 300 F_1 plants, all fertile, being collected in 1919. The F_2 plants obtained indicated that F_1 plants are subject to pollination by *T. durum*, which suggests to the author that *T. vulgare* v. *albidum* and some other varieties of *T. durum* and *T. vulgare* found mixed in the common wheats grown there, are possibly of hybrid origin. Reciprocal crosses between pure lines of *T. durum* and *T. vulgare*, when *T. durum* was the pollen parent, resulted in a smaller percentage of fertilized florets and a considerably higher germination of seed; while in F_2 the characters of *T. durum* were strengthened, the number of dwarf plants diminished and the number of sterile plants increased. Certain characters mendelize in F_2 , but this does not mean that any combination can be easily obtained in later generations. Dissimilarity to parent types is associated with sterility. Hybrids of durum type are more fertile than those of vulgare type and still more so than intermediates, but considerably fewer durum than vulgare types appear. *T. dicoccum*, *T. compactum*, and plants approaching *T. turgidum* were obtained synthetically in these crosses; also 19 varieties of *T. durum* and *T. vulgare* and a series of forms difficult to classify.—*C. E. Leighty*.

7076. OEHLKERS, FRIEDRICH. Vererbungsversuche an Oenotheren III. Das Sulfurea-merkmal bei Oenotheren. [Genetic investigations on Oenothera III. The sulphurea character in Oenothera.] Biol. Zentralbl. 44: 1-9. 1924.—The behavior of the sulphurea character as observed by the author in crosses involving *O. biennis*, *O. biennis sulfurea* and *O. suaveolens sulfurea* could not be explained by Renner's or Shull's hypotheses of the genetical constitution of those plants. The author explains the results by assuming that *O. biennis* is composed of *albicans* and *rubens*, and *O. suaveolens* of *albicans* and *flavens* complexes; *albicans* is viable in ♀ gametes only, *rubens* in ♂ and in a few ♀ gametes and *flavens* in ♂ and in 75% of ♀ gametes; *sulfurea* is determined by a simple mendelian recessive factor located in *albicans*, *rubens* and *flavens* complexes and therefore closely linked with them.—*M. Demerec*.

7077. PAERELS, J. J., K. TIEBES, EN J. C. TH. UPHOF. Bijdragen tot de kennis van enkele hollandsche groente-erwten I. (Some Dutch vegetable peas. I. Genetica 4: 23-31. 1922.—Crosses were made between garden peas frequently grown in the Netherlands, e.g., Blauwpeul, Groene Krombek, Vlijmsche Krombek, Kroonerwt, Wonder of America and Lage Kaapsche. Blauwpeul is a large brown-seeded pea with indented seeds. It has pigment in the testa, but does not possess the factor for spots. Krombek, with curved pods, yellow cotyledons and pigmentless testa, possesses this factor for spots; the cross Krombek × Blauwpeul gives spotted seeds in the F_1 .—*J. C. Th. Uphof*.

7078. PÉZARD, A., KNUD SAND, ET F. CARIDROIT. Potentialités homologues et potentialités hétérologues chez la poule domestique. [Homologous and heterologous potentialities in the domestic fowl.] Compt. Rend. Soc. Biol. 90: 737-739. 1924.—Six females of various ages were ovariectomized to study the effect on future plumage color. In 3 cases the plumage developed ♂-like on the right side of the body but the color was unchanged. In 3 other cases the plumage remained ♀ in character but the normal color was replaced in part by a new color. These studies indicate that normal plumage color will not always develop in the hen regardless of the presence or absence of the ovary. Hormones not present in the ovary are sometimes capable of modifying color when the ovary is removed.—*F. A. Hays*.

7079. REGAN, C. TATE. Mendelism and evolution. Nature 113: 50-51. 1924.—Regan quotes from Johannsen [see Bot. Absts. 12, Entry 4941] indicating the comparative minimal importance of mendelising allelomorphic characters and of mutations relative to the problems of species and evolution.—*L. R. Waldron*.

7080. ROBERTSON, CHARLES. Conditions of natural selection. Science 59: 363-364. 1924.—The author contends that species of plants and animals do not originate by variation or mutation but that "they separated first and got their differences later". The most important conditions of natural selection are diversification of food habits and of geographical and phenological ranges. Instances of diversification in these respects are cited in support of these claims.—*L. C. Dunn*.

7081. SAUNDERS, EDITH R. Further studies on inheritance in *Matthiola incana*. I. Sap colour and surface character. Jour. Genetics 14: 101-114. 1924.—This is the 12th paper in a series of publications on the inheritance of surface character, sap color, plastid color, and doubleness in the garden stock (*Matthiola incana*).—One of the 2 factors (*C* and *R*) which are necessary for sap color (taken to be *R*) was found to be closely linked with 1 of the 2 factors (*H* and *K*) which are necessary for hoariness (taken to be *H*).—On the other hand, a certain *F*₁ family the pedigree of whose parents was unknown, exhibited the ratio of hoary and smooth which we would expect were there no linkage of *R* and *H*. In further tests of this material, however, the independence of *R* and *H* was not found. It should be stated here that the presence of both *C* and *R* together with *H* and *K* are necessary for the production of hoariness. In addition to the factors *C* and *R* another factor (indicated by *A*) was found to be required for the production of sap color. Furthermore, it was proved by appropriate crosses that still another factor (indicated by *A*₁) must be present to produce sap color.—The precise part played in color production by *A* and *A*₁ and their relation to *C*, *R*, *H*, and *K* is not yet wholly clear.—*W. A. Carver*.

7082. SAVELLI, ROBERTO. Variazione brusca in *Nicotiana sylvestris* Spegazzini. [A mutation in *Nicotiana sylvestris*.] Ann. di Botanica (Rome) 15: 197-263. 52 fig. 1922.—A striking abnormality appearing suddenly and affecting the blossoms of *Nicotiana sylvestris* was investigated in much detail. This abnormality, which is confined almost entirely to the gynoeceum, is characterized by a succession of many detached carpels arranged in whorls along the prolongation of the floral axis in such a manner as to somewhat resemble a sort of gymnospermous strobilus, whereas in the normal flower only 2 united carpels constitute the gynoeceum. The ovules borne upon the placenta in the normal flower are now borne upon the upper surface of these abnormal carpels and show various peculiar changes in form and structure, in some instances becoming green or being transformed more or less completely into pistillate structures (ovular pistillody). The gynoeceum has not only failed to develop nectaries but has become entirely functionless making self-fertilization and the subsequent isolation of the abnormality as a pure race impossible. However, the original race continues to be a source of these mutations.—*H. A. Allard*.

7083. SCHULTZ, WALTHER. Erzeugung des Winterschwarz. Willkürliche Schwärzung gelber Haare. [The production of winter melanism. The blackening of yellow hair at will.] Arch. Entwicklungsmech. 51: 333-382. 2 col. pl. 1922.—The author notes that there is ordinarily more black in the coats of Himalayan rabbits in winter than in summer, which he compares to the winter melanism of various wild animals (squirrel, deer, etc.). By removing the hair and thus subjecting the bare skin to cold he was able to produce black spots at will. Experiments indicated that this was a direct effect of cold rather than of other influences such as light, humidity, oxygen supply, etc. He was similarly able to extend or reduce the black points of Himalayan guinea pigs through temperature, but in this case could not produce black spots elsewhere. He obtained very similar results with the Thüringian rabbit, a sooty yellow, with black at the points in a pattern resembling that of the Himalayan. Black spots could be brought out at will on any part of the coat by plucking the fur in cold weather. He experimented similarly with roosters having a barred pattern, red and white in part and black and white in part. In some cases plucked feathers with largely red and white barring were replaced by feathers with black and white barring. In these cases there was also a great change in shape, the long pointed feathers characteristic of males being replaced by broader, rounded "hen" feathers. The effects in poultry, however, did not appear to be directly dependent on temperature, but rather on state of nutrition. There is a long discussion in which similarity in the action of external environmental factors, hormones and genes is pointed out.—*Sewall Wright*.

7084. STEWART, B. Experiments on *Ciona intestinalis*. Nature 113: 14. 1924.—From copies of Kammerer's photographs of operated Cionas, Stewart has determined that the ratio of length to breadth in normal specimens is 1.5 and 1.65 of the oral and aboral siphons, respectively. Similar ratios of the operated Cionas were 4-4.3 and 2-4.3, respectively, in expanded animals. Siphon ratios of the foregoing offspring were 4.1 and 2.05, respectively. [See also Bot. Absts. 13, Entry 5017.]—*L. R. Waldron*.

7085. SUMNER, F. B. **Size factors and size inheritance.** Proc. Nat. Acad. Sci. U. S. A. 9: 391-397. 1923.—The author takes issue with Castle's (Carnegie Inst. Publ. 320, May, 1922) conclusions that factors affecting size are general rather than local in their action, and that size factors influence all parts of the body in the same direction. Sumner finds in his measurements of parts of the body (material from several species of mice), support for his contention that parts (feet, tail, ear) may vary independently of the size of the whole body. Breeding experiments have shown such variations to be heritable. The very high correlations between parts, on which Castle based his conclusions, are explained as partially due to spurious correlation. When the "gross" correlations are corrected and stated as "net" correlations they are reduced in amount. Gross and net correlations between parts of the body in mice are much lower than those found by Castle in rabbits. A residue of "net" correlation is said to be due to the dependent variation for several parts, although groups of parts may vary in size independently of the body as a whole. Data from parent-offspring correlations are cited as proof that the variabilities of the parts studied are genetic. The large size of the correlations found by Castle is further explained by pointing out that these correlations were derived from strains differing considerably in size, in which variations were occurring in the same direction. The author concludes that the hypothesis of general size factors fails to explain the data which he has obtained.—*L. C. Dunn.*

7086. TEMPLETON, G. S. **Unusual color inheritance.** Jour. Heredity 14: 39-40. 1 fig. 1923.—A red polled calf with the Hereford pattern from a mating of a purebred Angus bull by a purebred Hereford cow is reported. Thirty-nine other calves sired by this bull, 35 from pure bred Angus cows, 1 from a grade Shorthorn, and 3 from grade Jersey cows were all black. It is concluded that the bull was heterozygous for coat color.—*W. V. Lambert.*

7087. ZAPPAROLI, T. V. **Stato dei lavori di miglioramento del granoturco alla Stazione di Maiscoltura di Bergamo.** [Status of improvement work with corn at the Station for Corn Culture, Bergamo.] Staz. Sper. di Maiscoltura 3. 15 p., 2 pl., 3 fig. Bergamo, 1923.—Breeding work with corn at this station is reviewed and a discussion given of the inheritance of abnormalities appearing among the progeny of self-pollinated ears.—*H. M. Steece.*

7088. ZIMMERMAN, H. **Über menschlichen Albinismus.** [Albinism in man.] Arch. Rass.- u. Ges. Biol. 15: 112-136. 1923.—This is a discussion of numerous individual cases of degrees of albinism, which cannot be readily summarized.—*Robert T. Hance.*

HORTICULTURE

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(See also in this issue Entries 6351, 6874, 6902, 6912, 6945, 7341, 7349, 7355, 7354, 7438, 7483)

FRUITS AND GENERAL HORTICULTURE

7089 BARNEY, J. W. **Grafting old fruit trees.** Proc. Florida State Hort. Soc. 1923: 19-22. 1923.—Dipping the scions in warm paraffin, known as the Morris method, makes it possible to top-work old trees at any time from fall to spring. Details of the process are given.—*J. C. Th. Uphof.*

7090. BEACH, JOHN B. **Guatamalan and Mexican Avocados in Florida.** Citrus Industry 42: 22, 34. 1923.—The various varieties are briefly described.—*J. C. Th. Uphof.*

7091. BOLLES, W. E. **Commercial banana growing in Florida.** Citrus Industry 41: 18-19, 32. 1923.

7092. BRERETON, W. LE GAY. **Some notes on almond and walnut growing.** Agric. Gaz. New South Wales 35: 303. 1924.

7093. B[ROOKS], C. F. **Tree-top fruit damage by frost.** Bull. Amer. Meteorol. Soc. 3: 54. 1922.—A description of the damage with the probable meteorological explanation is given.—*Earl S. Johnston.*

7094. BUTLER, E. D. **Fruit export regulations.** Agric. Gaz. New South Wales 35: 289-290. 1924.

7095. CLAYTON, H. G. Some problems of the Satsuma orange grower. Proc. Florida State Hort. Soc. 1923: 79-81. 1923.—The author deals chiefly with soil problems.—J. C. Th. Uphof.

7096. COCKAYNE, L. The cultivation of New Zealand plants. iv + 139 p., 25 fig., 1 map. Whitcombe and Tombs: Christchurch, 1924.—Chapters are given on: procuring the plants, methods of cultivation, plants for decorating the home, native plants for school gardens and children's gardens, native plants for town gardening. The body of the book gives brief descriptions of some 700 species classified under the heads: trees, shrubs, veronicas, herbs, semi-woody plants, climbing plants, grasses, ferns. There is for each species (except ferns) a statement of the characters of horticultural importance, methods of propagation and cultivation, with an indication of the original habitat. An appendix is added consisting of 10 lists of plants suitable for special purposes. The figures are from photographs.—H. H. Allan.

7097. DALLIMORE, W. Pear wood. Kew Bull. 1922: 299, 300. 1922.—This is a brief article on the economic uses of the wood from old pear trees.—T. J. Fitzpatrick.

7098. FEALY, NELLIE E. Sugar-producing palms. Facts about Sugar 17: 58-61, 106-109, 134-136, 155-157, 162, 184-185, 187, 208-209, 252-253, 256-258. Fig. 1-27. 1923.—Sugar is made on a more or less commercial scale from the sap of 9 varieties of palms: *Arenga saccharifera* or sugar palm, *Borassus flabelliformis* or palmyra palm, *Caryota urens* or fish-tail palm, *Cocos nucifera* or coconut palm, *Corypha elata* or buri palm, *Corypha umbraculifera* or talipot palm, *Jubaea chilensis* or coquito palm, *Nipa fruticans* or nipa palm, and *Phoenix sylvestris* or wild date palm. The author discusses each variety from the standpoint of history, description, habitat, products other than sugar, and sugar, including methods of obtaining the sap, methods of manufacture, and yield. An extensive bibliography is included.—Author.

7099. GOODWIN, R. L. Open culture of red Spanish pineapples. Proc. Florida State Hort. Soc. 1923: 62-64. 1923.—Cultural methods and costs, especially those of St. Lucie County, Florida, are given.—J. C. Th. Uphof.

7100. HARVEY, E. M. A study of growth in summer shoots of the apple with special consideration of the rôle of carbohydrates and nitrogen. Oregon Agric. Exp. Sta. Bull. 200. 1-51. 27 fig. 1923.—The author measures the increase in length of normal growing apple shoots after ringing, defoliation, and ringing with defoliation. These growth data are accompanied by chemical analyses of different regions of the treated shoots. Chemical analyses of the tips, middle and basal regions of untreated shoots indicate that water, nitrogen and soluble solids are greatest in the tip while the total carbohydrates are greatest in the basal region, with the middle portion intermediate. Completely defoliated Grimes shoots grew more rapidly than normal shoots, while completely defoliated Spitzenburg shoots made much less increase in length than normal untreated shoots. The author explains this by the difference in the stage of development of the particular shoots concerned, together with the chemical conditions which seem to accompany these differences. The major study of the bulletin considers the effects of ringing and defoliation on larger and older shoots than those discussed above. In Grimes the percentage of increase in growth was greatest with the defoliated shoots, followed by the ringed, check, and ringed plus defoliated shoots, in the order named. With Spitzenburg the ringed shoots made the greatest increase, followed by the checks, defoliated, and ringed plus defoliated shoots. It is pointed out that ringing accelerates or retards growth according to the stage of development of the particular shoot. By ringing shoots at intervals during the growing season a complete reversal of the effects of ringing was demonstrated. Chemical analyses indicated an increase in the percentages of water and nitrogen and a decrease in the total carbohydrates in the upper portions of the defoliated shoots. The chemical changes in the upper portion of the shoot accompanying ringing seemed to be the reverse of those accompanying defoliation. The chemical changes produced in the bases of shoots which (in their top portions) received ringing, defoliation and ringing plus defoliation, were of the same quality as the responses mentioned above for ringing and ringing plus defoliation. A general explanation is offered to unify the diverse growth responses of shoots to ringing and defoliation.—C. E. Owens.

7101. HENRY, A. M. Some factors influencing the maturity of citrus fruit. Proc. Florida State Hort. Soc. 1923: 118-120. 1923.—Evidence is presented showing a correlation of thin skin with high quality and high content of solids in oranges and grape fruit. Acidity and

moisture decrease in oranges after picking; this occurs more rapidly in early maturing than in late maturing varieties. The acid content may be reduced by excess applications of $(\text{NH}_4)_2\text{SO}_4$, or by spraying with arsenicals. There is some evidence that the coloring of grape fruit is hastened by spraying with lime-sulphur.—*J. C. Th. Uphof*.

7102. HIGGINS, J. E. **Seediness in pineapples.** *Philippine Agric.* 12: 333-338. 1924.—Seediness is uncommon in the Cayenne variety, but is common in semi-wild varieties. Causes of seediness and remedies are discussed.—*Sam F. Trelease*.

7103. PALMER, A. H. **Protecting fruit from frost damage.** *Bull. Amer. Meteorol. Soc.* 3: 173-174. 1922.—Renewed interest in frost-fighting devices is the result of the previous winter's freezes in the citrus fruit regions of California.—*Earl S. Johnston*.

7104. REID, OONA. **The propagation of camphor by stem cuttings.** *Trans. & Proc. Bot. Soc. Edinburgh* 28: 184-188. *Pl.* 9-11. 1923.—Propagation experiments with etiolated shoots showed that cuttings from etiolated branches rooted more rapidly than those from normal branches.—*L. R. Abrams*.

7105. UPHOF, J. C. TH. **Fruit culture in Florida.** *Kew Bull.* 1922: 241-248. 1922.—This article is a general résumé of a paper by the author dealing with his fruit growing experiences in Florida. Detailed information is given under the following heads: citrus fruits, oranges, tangerines, satsumas, grape fruit, kumquats, lemons, limes, avocados, mangos, peaches, persimmons, and pecans. Meteorological data for 1920 are included as well as a page on fungus and insect pests prevalent in the orchards.—*T. J. Fitzpatrick*.

FLORICULTURE AND ORNAMENTAL HORTICULTURE

7106. ANONYMOUS. **List of seeds of hardy herbaceous plants and of trees and shrubs.** *Kew Bull.* 1922: appendix I, 1-28. 1922.—This is a list of selected seeds which for the most part have ripened at Kew during the year 1921.—*T. J. Fitzpatrick*.

7107. ANONYMOUS. **The government gardens, Sokoto, Nigeria.** *Kew Bull.* 1922: 316-332. *3 pl.* 1922.—The gardens were established by R. Moiser in 1916 and at present cover about 35 acres. English vegetables have been grown and many flowers introduced.—*T. J. Fitzpatrick*.

7108. BERGER, V. **Meine Rosa rugosa Neuzüchtung "Stern von Prag."** [My *Rosa rugosa* novelty "Stern von Prag."] *Möllers Deutsch. Gärtnerzeitg.* 29: 77. *1 fig.* 1924.—This hybrid originated in a cross of a *Rosa rugosa* seedling with Eduard Mawley. It is very resistant to cold. The double flowers resemble Eduard Mawley in color and have a very strong and agreeable odor. One-year-old budded plants flower profusely.—*J. C. Th. Uphof*.

7109. BOYNTON, KENNETH R. **Alstroemeria aurantiaca.** *Addisonia* 8: 33. *Pl.* 273 (col.). 1923.—This species of the Amaryllis family, native of Chile, is a tuberous-rooted herb with ornamental orange-yellow flowers. It has been grown outdoors under special conditions as far north as New York and Boston. So far there has been only a limited introduction.—*T. J. Fitzpatrick*.

7110. BOYNTON, KENNETH R. **Chrysanthemum "California."** *Addisonia* 9: 7, 8. *Pl.* 292 (col.). 1924.—This variety originated in the nursery of R. Shibuya, Menlo Park, California, in 1917. It is a late bloomer of the pompon type with pink rays which are light yellow at the bases; the disk flowers, hidden at first, are yellow.—*T. J. Fitzpatrick*.

7111. BOYNTON, KENNETH R. **Chrysanthemum "Christmas gold."** *Addisonia* 9: 13, 14. *Pl.* 295 (col.). 1924.—This is a variety developed for lateness of bloom, by Bates Brothers of Cleveland, Ohio. The heads of flowers are small, hemispheric, $\frac{3}{4}$ inch in diameter, yellow, and of pompon type.—*T. J. Fitzpatrick*.

7112. BOYNTON, KENNETH R. **Chrysanthemum "Cranfordia."** *Addisonia* 9: 11, 12. *Pl.* 294 (col.). 1924.—This is a variety blooming in October, introduced into the U. S. A. in 1909 from Europe by Charles H. Totty Co. The heads are yellow, nearly 3 inches across, and shaggy; the rays are often curled or twisted.—*T. J. Fitzpatrick*.

7113. BOYNTON, KENNETH R. **Chrysanthemum "Emma."** *Addisonia* 9: 15. *Pl.* 296 (col.). 1924.—This is a variety of the Anemone type, with an enlarged and prominent disk, and white rays, the flower-heads being about $2\frac{1}{2}$ inches in diameter. It originated in the conservatories of Mrs. Payne Whitney, Manhasset, Long Island, N. Y., and was exhibited in 1918.—*T. J. Fitzpatrick*.

7114. BOYNTON, KENNETH R. *Chrysanthemum* "Joan Edwards." *Addisonia* 9: 1, 2. *Pl. 289 (col.)*. 1924.—This is a showy, late-blooming, single variety; with heads about 2 inches in diameter, showy, pinkish, fertile ray flowers usually in 2 rows, and many, fertile, tubular, disk flowers. The foliage is strongly scented.—*T. J. Fitzpatrick*.

7115. BOYNTON, KENNETH R. *Chrysanthemum* "Nellie Blake." *Addisonia* 9: 9. *Pl. 293 (col.)*. 1924.—This variety originated in England and was imported to the U. S. A. in 1918 by Charles H. Totty Co. The flower heads are about 3 inches across, showy, pinkish, and of the pompon type.—*T. J. Fitzpatrick*.

7116. BOYNTON, KENNETH R. *Chrysanthemum* "Rena." *Addisonia* 9: 5, 6. *Pl. 291 (col.)*. 1924.—This variety was introduced by C. H. Totty in 1919. It is a late bloomer with reddish flowers of the pompon type.—*T. J. Fitzpatrick*.

7117. BOYNTON, KENNETH R. *Chrysanthemum* "White Doty." *Addisonia* 9: 3, 4. *Pl. 290 (col.)*. 1924.—This fine, white variety, usually of the double type, has been cultivated for centuries in China and Japan. It was brought to England by Fortune in 1846, and later introduced into Australia and America.—*T. J. Fitzpatrick*.

7118. BOYNTON, KENNETH R. *Colletia cruciata*. *Addisonia* 8: 59. *Pl. 286 (col.)*. 1923.—This thorny shrub of the *Rhamnaceae*, native of Brazil and Uruguay, is readily grown in cool greenhouses from seed or cuttings. Where it can be grown in the open it makes an excellent hedge.—*T. J. Fitzpatrick*.

7119. BOYNTON, KENNETH R. *Stenocarpus sinuatus*. *Addisonia* 8: 49, 50. *Pl. 281 (col.)*. 1923.—This tulip tree of the *Proteaceae*, native of Australia, attains a height of 60–100 feet. It is an evergreen, and has ornamental flowers in umbel-like clusters.—*T. J. Fitzpatrick*.

7120. BOYNTON, KENNETH R. *Stephania incisa*. *Addisonia* 8: 63. *Pl. 288 (col.)*. 1923.—This is a shrub of the *Rosaceae*, native of Japan and Korea, may be propagated by seed or cuttings. The flowers and leaves are ornamental, with a spiraea-like aspect.—*T. J. Fitzpatrick*.

7121. BOYNTON, KENNETH R. *Swainsonia galegifolia*. *Addisonia* 8: 43, 44. *Pl. 278 (col.)*. 1923.—*Swainsonia* is a genus of the Pea family, comprising about 30 species of shrubs native to Australia. The species is a low, diffuse shrub, easily grown from cuttings, and thrives in a cool greenhouse. The flowers resemble sweet pea, and a number of color varieties have been developed.—*T. J. Fitzpatrick*.

7122. BRITTON, N. L. *Bignonia radicans*. *Addisonia* 8: 39, 40. *Pl. 276 (col.)*. 1923.—This widely cultivated ornamental species of southeastern U. S. A. was first described by Cornutus in 1635 and was among the early ornamental plants introduced into Europe. The genus *Bignonia* was first published by Tournefort at least as early as 1719 and was retained by Linnaeus. As now delimited, *Bignonia* consists only of *B. radicans* L. and *B. grandiflora* Thunberg of China and Japan.—*T. J. Fitzpatrick*.

7123. BRITTON, N. L. *Hamelia axillaris*. *Addisonia* 8: 51. *Pl. 282 (col.)*. 1923.—This is a shrub belonging to the Rubiaceae and native of the West Indies, possesses minor ornamental qualities.—*T. J. Fitzpatrick*.

7124. BRITTON, N. L. *Lagetta lagetto*. *Addisonia* 8: 61, 62. *Pl. 287 (col.)*. 1923.—This small tree of the family *Thymelaeaceae*, known as the lace-bark tree, is a native of Jamaica, Cuba, and Haiti. The inner bark may be made into ropes or used as a substitute for cloth. The flowers are borne in narrow, drooping spikes and are more or less ornamental.—*T. J. Fitzpatrick*.

7125. BRITTON, N. L. *Phlebotaenia cowellii*. *Addisonia* 8: 47, 48. *Pl. 280 (col.)*. 1923.—This ornamental flowering tree of the *Polygalaceae*, native of Porto Rico, attains a height of 60 feet and is conspicuous when in bloom because of its numerous clusters of purple flowers. It was discovered in 1906 and described in 1907, but it occurs rarely and seems to have a very limited distribution.—*T. J. Fitzpatrick*.

7126. DALLIMORE, W. The fruiting of *Ginkgo biloba* at Kew. *Kew Bull.* 1922: 262–265. 1 pl. 1922.—Particulars are given concerning the fruiting in 1919 and again in 1922 of a male tree, the fruiting branch having been grown from a graft of a female tree. These are the 1st cases known in Britain. The tree became known to western botanists through Engelbert Kaempfer who visited Japan in 1692 and who published the species in 1712 in his *Amoenitatum Exoticarum*. Between 1727 and 1737 a tree which probably still exists was imported to Utrecht

Botanic Garden. In 1790 an imported tree was planted near Geneva which proved to be a female, this discovery being made by A. P. DeCandolle in 1814. He had scions of this tree distributed over Europe and grafted on male trees, including those at Vienna and Montpellier and probably also Utrecht. The tree is hardy, grows well under very diverse conditions, and is rarely attacked by insects or disease, and may be extensively employed to advantage in decorative plantings.—*T. J. Fitzpatrick.*

7127. ENGELMANN, C. Die besten amerikanischen und englischen Nelken Neuheiten. [The best American and English carnation novelties.] Möllers Deutsch. Gärtnerzeitg. 29: 101-102. 8 fig. 1924.

7128. GRAHAM, R. J. D., AND L. B. STEWART. Vegetative propagation of *Haemanthus hirsutus* Baker. Trans. & Proc. Bot. Soc. Edinburgh 28: 183-184. 1923.—Adventitious buds formed on scale leaves placed on sand and given occasional water or left dry on a shelf. Propagating from these buds gave early maturity.—*L. R. Abrams.*

7129. HOLLICK, ARTHUR. *Menispermum canadense*. Addisonia 8: 41, 42. Pl. 277 (col.). 1923.—This slender, woody vine is found along borders of woods and streams, ranging over much of the eastern half of North America. The 1 or 2 other species are natives of central and eastern Asia. Ancestrally the genus may be traced back to the early Cretaceous period. The leaves and fruit have some ornamental characters.—*T. J. Fitzpatrick.*

7130. HOLLICK, ARTHUR. *Syndesmon thalictroides*. Addisonia 8: 55. Pl. 284 (col.). 1923.—This monotypic genus proposed by Hoffmannsegg in 1832, is native of eastern U. S. A. and southern Canada. It is a perennial herb of delicate, anemonoid aspect, growing in shady places, ornamental, and suitable for transplanting under proper conditions.—*T. J. Fitzpatrick.*

7131. JUNGE, HEINRICH. Winterharte Kakteen. [Winterhardy cacti.] Möllers Deutsch. Gärtnerzeitg. 29: 106-107. 1924.—Cactus species which are resistant to the winters in the neighbourhood of Hanover, Germany, are *Cereus procumbens*, *Mammillaria missouriensis*, *Opuntia brachyarthra*, *O. comanchica*, *O. comanchica minor*, *O. cymochila*, *O. humilis*, *O. missouriensis*, *O. Rafinesqui*, *O. Rafinesqui arkansana*, *O. rhodantha*, *O. rutila*, *O. spirocentra* and *O. xanthostemma fulgens*.—*J. C. Th. Uphof.*

7132. LOVELL, JOHN H. Heather in New England. Maine Nat. 1: 74. 1 pl. 1921.—Two or 3 acres of heather have been planted on an estate at Lancaster, Mass.—*C. A. Weatherby.*

7133. LOVELL, JOHN H. Night-blooming flowers. Maine Nat. 2: 97-100. 3 pl. 1922.—*Lonicera Periclymenum*, *Oenothera biennis*, *Silene noctiflora*, *Dianthus arenaria*, *Saponaria officinalis*, *Lychnis alba*, and *Angraecum sesquipedale* are noted.—*C. A. Weatherby.*

7134. LYBRICH, ST. Eine neue winterharte Aster Rasse, Aster Frikarti "Wunder von Stäfa." [A new winter-hardy Aster, "Wunder von Stäfa."] Möllers Deutsch. Gärtnerzeitg. 29: 87. 1 fig. 1924.—This seedling of *Aster Thomsoni* has yellow disk, and sky-blue ray flowers. It was originated by Karl Frikart of Stäfa, Switzerland.—*J. C. Th. Uphof.*

7135. PFITZER, W. Treibveilchen "Schwabenmädchen." [The forcing violet "Schwabenmädchen."] Möllers Deutsch. Gärtnerzeitg. 29: 89. 1924.—*Viola odorata* Schwabenmädchen is recommended for forcing. It has dark blue flowers, larger than those of Königin Charlotte. The flowerstocks are stiff, and 8-10 cm. long. It was originated by W. Pfitzer of Stuttgart.—*J. C. Th. Uphof.*

7136. POHLIG, MAX. Winterharte Chrysanthemen. [Winterhardy chrysanthemums.] Möllers Deutsch. Gärtnerzeitg. 29: 67-68. 1924.—Varieties resistant to the winters of Dresden, Saxony, are listed.—*J. C. Th. Uphof.*

7137. REED, GEORGE M. Irises. Brooklyn Bot. Gard. Leaflets 12⁶⁻⁶: 1-8. 1924.—The origin, classification, methods of cultivation and propagation, and diseases of irises, including the more popular garden varieties, are here discussed, and a list is given of varieties recommended for cultivation.—*A. H. Graves.*

7138. ROSE, J. N. *Hamatocactus setispinus*. Addisonia 8: 45, 46. Pl. 279 (col.). 1923.—This ornamental species of a monotypic genus is native of Texas and northern Mexico. It is usually included in the genus *Echinocactus*.—*T. J. Fitzpatrick.*

7139. RYDBERG, P. A. *Rosa palustris*. Addisonia 8: 37, 38. Pl. 275 (col.). 1923.—This ornamental species of swamp rose, native of eastern North America and first described by Marshall in 1785, has been confused with *Rosa carolina* L. and *Rosa humilis* Marsh., an error perpetuated by most botanists. Corrections are made and proper delimitation given. Many

hybrids are artificially produced among roses and many occur among the wild species.—*T. J. Fitzpatrick.*

7140. RYDBERG, P. A. *Salvia pitcheri*. *Addisonia* 8: 53, 54. *Pl.* 283 (col.). 1923.—This perennial herb, with very ornamental flowers, native of the south central U. S. A., is frequently confused with *Salvia azurea* Lam.—*T. J. Fitzpatrick.*

7141. SMALL, JOHN J. *Ardisia polycephala*. *Addisonia* 8: 57, 58. *Pl.* 285 (col.). 1923.—This evergreen shrub of the Myrsinaceae, native of the East Indies, has an ornamental aspect, especially the flowers and fruit. In the tropics and subtropics it is used for borders or hedges; farther north it does well in conservatories.—*B. J. Fitzpatrick.*

VEGETABLE CULTURE

7142. ANONYMOUS. Food of the Gold Coast people. *Kew Bull.* 1922: 350, 351. 1922.—The chief cereals are rice, maize, and Guinea-corn. Other crops are cow pea (*Vigna Catjang*), Bambarra ground-nut or round single-seeded earth pea (*Voandzeia subterranea*), pigeon or Congo pea (*Cajanus indicus*), soya bean (*Glycine soja*), and ground-nut (*Arachis hypogaea*). The vegetables used as food are tiger-nut (*Cyperus esculentus*), yams and coco-yams, okros, spinach, garden eggs, sweet potato, and introduced *Sechium edule* and *Cucurbita moschata*. The article is based on a report by J. M. Dalziel in the *Jour. Gold Coast Agric. and Commercial Soc.* 14. 1922.—*T. J. Fitzpatrick.*

7143. ALBERT, D. W. Growing spinach in Arizona. *Timely Hints For Farmers* 144. 1-9. 3 fig. *Arizona Agric. Exp. Sta.*, 1923.—Soil and climatic conditions in Arizona are favorable for the production of spinach. At the Yuma Experiment Station spinach thrived on soil that was too alkaline for lettuce. Acid phosphate increased the yield 65% over check plots and hastened maturity; sulphur gave no beneficial results. Varieties, soils, culture and diseases are briefly discussed.—*J. G. Brown.*

7144. BEATTIE, J. H. Handling and storing of sweet potatoes. *Rept. Maryland Agric. Soc.* 7: 360-365. 1922 (1923).

7145. BEST, E. The taro, *Colocasia antiquorum*. *New Zealand Jour. Sci. and Tech.* 5: 204-205. 1 fig. 1922.—The Maoris introduced 4 cultivated food-plants: kumara (*Ipomaea batatas*), taro, yam (*Wioscorea sp.*) and hue (*Lagenaria vulgaris*). The last 2 are no longer grown, the taro only in rare cases, and the kumara in decreasing amounts.—*H. H. Allan.*

7146. BOSWELL, VICTOR R. Changes in quality and chemical composition of parsnip under various storage conditions. *Maryland Agric. Exp. Sta. Bull.* 258. 61-86. 1923.—Parsnips were dug in the fall and stored from Oct. 21 to March 14, under the following conditions: 20°F. exposed to air; 34°F. both packed in moist sawdust, and exposed to air; in storage cellar, packed in moist sawdust, and exposed to air; and left undug in the soil. Analyses of moisture and carbohydrates made at the beginning and at the end of the test, as well as during the storage period, are reported in detail. In general, sucrose greatly increased, while starch and other polysaccharides correspondingly decreased in amount. This change was least in the roots frozen solid at 20°F., and was disturbed by the drying and accompanying lignification of roots stored in the cellar exposed to air. High quality was closely correlated with high sucrose content. Accumulation of sucrose was most rapid at 34°F. at which temperature starch entirely disappeared. Starch reappeared to some extent when roots were moved to 45-50°F.—*H. A. Jones.*

HORTICULTURAL PRODUCTS

7147. BARGER, WM. The coloring of citrus fruit in Florida. *Proc. Florida State Hort. Soc.* 1923: 180-183. 1923.—In the gas treatment of citrus fruit to improve color, the green pigment of the skin is destroyed, leaving the yellow. Details of the process are given.—*J. C. Th. Uphof.*

7148. CALDWELL, JOSEPH S. Evaporation of fruits. *U. S. Dept. Agric. Bull.* 1141. 1-52. 18 fig. 1923.—The extent and character of the fruit drying industry and the principles involved are discussed. Various types of drying plants for the different fruits are described in detail, followed by specific directions for the treatment of apples, peaches, apricots, pears, cherries, prunes, and small fruits. Methods of storing, packing, and marketing are included.

Federal and state laws regarding evaporated and dried fruits are briefly summarized.—*A. D. Oxley.*

7149. LOMIBAO, PATRICIO, AND CALIXTO T. ZAMUCO. Some methods of preserving mangoes. *Philippine Agric.* 12: 323-331. 1924.—Fruits of *Mangifera indica* Linn. may be preserved by drying. Better results were secured by canning with a thin syrup.—*Sam F. Trelease.*

7150. MATLACK, SHELTON G. Canning of grapefruit to establish year-round demand. *Florida Grower* 29¹⁶: 6-7. 1924.—The canning of grapefruit in Florida is a new industry. Details of the process are given.—*J. C. Th. Uphof.*

MORPHOLOGY, ANATOMY, AND HISTOLOGY OF VASCULAR PLANTS

E. W. SINNOTT, *Editor*

(See also in this issue Entries 6937, 6947, 7318, 7324, 7329, 7402, 7456, 7458)

7151. COCKAYNE, L. On the seedling form of the coral-shrub (*Helichrysum coralloides* (Hook. f.) Benth. and Hook. f.). *New Zealand Jour. Sci. and Tech.* 2: 274-278. 1 pl. 1919.—This species occurs as a rock-crevice plant of restricted range in the northern part of the South Island of New Zealand. On sub-alpine, wind-swept, dry rocks, strongly insolated, it forms dense, rigid cushions up to 46 cm. tall by 33 cm. in diameter. Sheltered from wind it becomes a small, erect shrub of open habit. Growing in shade it bears long, spreading branches. The scale-like leaves are appressed to slender glabrous stems, and are covered with dense white tomentum, except the glossy-green apices. The only seedling plant observed bore 11 short branches surrounding a main shoot 8 cm. tall. The stems were densely clothed with spatulate leaves 12×7.5 mm., covered with white, wooly hairs, the blades patent but sheathing at the base. Some of the leaves on younger shoots approximated those of adult plants. The ecological bearing of the data is briefly discussed.—*H. H. Allan.*

7152. EYSTER, WILLIAM H. A primitive sporophyte in maize. *Amer. Jour. Botany* 11: 7-14. 3 fig. 1924.—In the most primitive sporophytes growth is essentially continuous, but in the seed plants it is interrupted in the seed stage, the young sporophyte passing through a period of dormancy. This may be due to the impervious character of the seed coat or to the inherent nature of the sporophyte itself. In maize a sporophyte has been found which has a continuous development from the fertilized egg to the new plant. Under natural conditions this results in death because of an insufficient water supply. This continuous development is inherited in maize as a simple mendelian recessive and appears to be closely linked with factors for pale yellow endosperm and albino seedling.—*E. W. Sinnott.*

7153. ISTVÁNNFI, GYULA. A kukoricza technikai elemeiröl. [The technical elements of maize.] *Math. Term. tud. Ért. (Magyar. Tud. Akad.)* 1922. [Separate from *Bull. Math. and Sci. Hungarian Acad. Sci.* III, 39: 199-205. 1922.]—The fibers of maize are used for maize paper. In the ripe stalk they are of 2 kinds, smooth, and rough. In the 1st type the external surface is uniform but the cell wall itself may vary in diameter with corresponding variations in size of lumen. These smooth fibers are long and are frequently flattened. The rough fibers have also a cell wall of unequal thickness, but in this type small superficial pits with pores reaching through the wall are prominent. The rough fibers are much shorter than the smooth ones, are spindle shaped at the ends, and are commonly branched. The cellulose from maize stalks is very pure and gives the characteristic reactions with I, I and H_2SO_4 , and with cuprammonia. Treated with cuprammonia, the wall layers of the fibers show an especially characteristic differential swelling.—Measurements of the various cellular elements in stalk, leaf and husk are given.—*Author.*

7154. LANGDON, LADEMA M. Stem anatomy of *Dioon spinulosum*. *Bot. Gaz.* 70: 110-125. Pl. 15-18, 4 fig. 1920.—This is primarily a study of certain histological features of the adult stem of *D. spinulosum*, particular attention being given to the broad foliar rays with their included leaf traces. The author finds 3 types of medullary rays in the adult wood: narrow (uniseriate) rays, wider (bi- and tri-seriate) rays, and broad (multiseriate) rays—the so-called foliar rays. The last named, always a conspicuous feature of the wood, extend

from pith to cortex and are characterized by the presence of 1, rarely 2, leaf trace bundles to which they owe their origin. The manner of formation of the peculiar tracheidal elements of these leaf trace bundles, and the nature of the connection of these same elements with the primary and secondary wood of the adult stele, are points considered in detail. It is suggested that the vertical enlargement and elongation of these scalariform tracheids in the large medullary rays may be due either to a stretching occasioned by growth of the adjoining living parenchyma tissue or to a gradual lignification and subsequent fusion of parenchyma cells lying between the down-curving tracheids of the trace and the perpendicular elements of the main stele, or to both causes. A study is also made of the course and organization of the fibrovascular bundles in the cortical part of the stem. This phase of the investigation is largely confined to an examination of 2-, 3-, and 10-year-old seedlings of *D. spinulosum*. Where detail in connection is required, cleared material is supplemented by serial sections. In opposition to the statements of previous investigators of the seedling anatomy of *Dioon*, the author reports that the cortical leaf traces are not horizontal throughout their entire extent, but combine a vertical and a horizontal direction through the cortex in their course toward the leaves. For each leaf or scale-leaf, 7-9 strands separate from the vascular cylinder. The 2 inner traces, arising from the proximal side of the central cylinder, pursue a fairly direct and vertical course into the ventral part of the petiole; the rest of the traces, leaving the stem cylinder at different points, pass obliquely upward into the cortex and sheathing base of the leaf, where an anastomosis of traces takes place, resulting in the 2 characteristic girdles. The leaf traces of *Dioon*, therefore, include not only "girdles" but also a variable number of lateral, oblique traces associated with each girdle—*Author*.

7155. LEWIS, FREDERIC T. The typical shape of polyhedral cells in vegetable parenchyma and the restoration of that shape following cell division. *Proc. Amer. Acad. Arts and Sci.* 58: 537-552. *Pl. 1-3, fig. 1-2*. 1923.—The author studied elder-pith (*Sambucus*) as representing a typical condition and found that the cells are tetrakaidecahedral, or 14-sided, but modified in rather definite ways, more than $\frac{1}{2}$ of them having 13, 14 or 15 sides. The study was made by constructing wax models of the original cells in the tissues. Deviation from the typical form results from cell division, after which the resulting cells have but 11 surfaces. Restoration of the lacking surfaces depends upon the division of adjacent cells. An unequal division may reduce the surfaces to 8 or even 7. Restoration of the tetrakaidecahedral form after vertical divisions is a complex process of readjustment.—*John H. Schaffner*.

7156. MACDUFFIE, R. C. Vessels of the Gnetalean type in Angiosperms. *Bot. Gaz.* 71: 438-445. *Pl. 29-32*. 1921.—Perforations which, like those of *Gnetum*, originate from the haphazard fusion of grouped pits, have been found in the Rosaceae (*Potentilla palustris* (L.) Scop., and *P. monspeliensis* L.); the Geraniaceae (*Petargonium* spp., *Tropaeolum* sp.) and in the Ranunculaceae (*Clematis* spp.). In *Potentilla monspeliensis*, perforations of the scalariform and Gnetalean types occur together. Hence, theories of the separate origin of Gnetales and Angiosperms cannot be based on the supposition that perforations in the vessels of the latter always originate by scalariform fusion, and that fusion of the Gnetalean type does not occur.—*G. S. Torrey*.

7157. MCLUCKIE, J. A contribution to the parasitism of *Notothixos incanus* (Oliv.) var. *subaurens*. *Proc. Linnean Soc. New South Wales* 47: 571-580. 11 fig. 1922.—This parasite frequently occurs upon species of *Loranthus*, and the author has also found it growing upon branches of *Phyllanthus*, *Eucalyptus corymbosa*, *Angophora lanceolata* and several species of *Casuarina*. It branches dichotomously and its young shoots and leaves are covered by a thick tomentum of golden-yellow, multicellular, branched hairs. The flowers are usually sessile, and occur in small pedunculate inflorescences. The fruit, which ripens in about 12 months, is small, semi-succulent and tomentose, and contains a single gelatinous-coated seed. This parasite is distributed over the eastern portion of New South Wales from the coast district to the Blue Mountain plateau.—Dissemination occurs during moist weather when plant transpiration is reduced and the moisture content of the fruits is increased. The cells of the gelatinous coat are arranged so that extrusion takes place from the base of the fruit after it has been shed. The walls of the gelatinous cells consist of 2 layers, a mucilaginous outer and an inner spirally coiled cellulose layer. The seeds germinate on living or dead twigs and leaves, on the ground or on fences. The gelatinous seed-coat provides the embryo

with water until it has penetrated to the xylem of the host.—The root has no root-cap; it is not geotropically sensitive, but is negatively phototropic and frequently executes considerable curvatures to bring its apex into the favorable light relation. A holdfast develops from the root-apex and from the center of this the haustorial tissue grows into the host tissues, penetrating by pressure and chemical solution. Its peripheral layer is slightly papillate. A cambium develops in the haustorium, partially replacing the cambial ring of the stem. From this, secondary tissues are developed in a radial manner. Sieve tubes are not present in the haustorium but laticiferous-like tissues are developed. The haustorium is considered as morphologically a part of the primary root of the embryo, specialized for absorption from the tissues of a host. The leaves are characteristically xerophytic, and xerophily is consistent with parasitism upon the water tissues of the hosts.—*Eloise Gerry.*

7158. NYLANDER, OLAF O. *Life history of Calypso*. *Maine Nat.* 2: 82-83. 1 pl. 1922.—The flower of this orchid is attacked by many birds and beasts; in over 20 years the author has seen hardly a dozen fully developed buds. In shallow moss with hard substratum, the corm is oval or round; it becomes elongate and slender in deep, soft moss. After flowering, a new corm is developed at the side of the old. In late July or August the new corm sends up a leaf which is fully developed by fall and lasts through the winter. In September the flower bud for the next season is formed, not in the axil of the leaf, but a short distance from it.—*C. A. Weatherby.*

7159. PRANKERD, T. L. *Statocytes of the wheat haulm*. *Bot. Gaz.* 70: 148-152. 4 fig. 1920.—The wheat haulm possesses 2 types of statocytes, which occur only at the nodes: (1) the smaller statocytes contain moveable starch grains, (2) the larger ones each possess one moveable crystal of calcium oxalate. The rate of fall of the crystal is much greater, and the period of migration considerably less, than the corresponding quantities for the starch grains. The author suggests that the plant is substituting in the course of evolution a body metabolically harmful, but heavier and hence quicker and better as a statolith, for the usual starch grains required as nutriment for the ear.—*Author.*

7160. REICHE, KARL. *Entwicklung, Bau und Leben der Euphorbia radians Benth., einer knollentragenden Art*. [Development, structure and biology of *Euphorbia radians* Benth., a tuberous species.] *Flora* 116: 259-269. 7 pl. 1923.—This is a study of an endemic inhabitant of the steppes of Mexico, describing the plant in detail with especial emphasis on the root, which consists of one to several tubers separated by thin cylindrical regions. The structure of the tuberous portion departs in general from the regular arrangement of roots in that the cambium forms vessels with great irregularity. Seed were sown in flower pots and their germination studied. The aerial portion lagged far behind the roots in development. In 3 months tubers with lateral roots had formed. To discover the cause of tuber-formation, very young seedlings were transferred to nutrient solution, but no tubers formed. The author suggests that contact with the soil may give one, if not the only, impulse to tuber-formation. Many shortened lateral branches developed, perhaps as a correlation to the lack of tubers. The cymes have glands on the border and are surrounded by white or red bracts, but as these glands do not secrete a sugary sap, they should not be regarded as nectaries. As the showy bracts appear in the cold and dry periods when but few insects are present, they have no biological significance. Eight other species of *Euphorbia* are mentioned as producing tubers. The tubers and inflorescences are occasionally used as food.—*Anna M. Starr.*

7161. SEATON, IAN W. *The seedling structure of Salix pentandra L.* *Trans. & Proc. Bot. Soc. Edinburgh* 28: 161-163. Pl. 8. 1923.—A general description is given of the seed structure and embryo as well as of the young seedling.—*L. R. Abrams.*

7162. SMITH, R. WILSON. *Bulbils of Lycopodium lucidulum*. *Bot. Gaz.* 69: 426-437. 21 fig. 1920.—With the object of determining the morphological value of the bulbils, the writer describes the origin of branches and leaves and the origin and structure of bulbils. The latter do not arise by dichotomy of the stem apex nor is their vascular structure at all similar to that of the branches. In the phyllotaxy they replace leaves, and their connections with the vascular cylinder of the stem are indistinguishable from leaf traces. The bulbil is, therefore, regarded as a modified leaf.—The paper contains also some observations on the rate of growth and the habit of *Lycopodium lucidulum*.—*Author.*

7163. STEWART, L. B. Note on juvenile characters in root and stem cuttings of *Acanthus montanus*. Trans. & Proc. Bot. Soc. Edinburgh 28: 117-118. 1922.

7164. TRINGKELD, RICHARD. Beiträge zur Morphologie der Vegetations-organe der Cucurbitaceen. [Morphology of the vegetative organs of the Cucurbitaceae.] Flora 116: 270-295. 1 pl. 1923.—Numerous species of the Cucurbitaceae were studied with especial reference to the nature of the tendrils. Tendrils with several branches and most of those with single branches agree in anatomy. The tendril-bearer—the lower, straight, non-sensitive part of tendrils with a single branch—is like the simple portion of those with several branches in having a closed ring of sclerenchyma and a radial arrangement of the bundles. The structure remains unaltered throughout its entire length. The branches of forms having several branches, and the upper part of forms with a single branch, have the same structure—an open arc of sclerenchyma, collenchyma in long strands, dorsiventral arrangement of the bundles, and a gradual change in structure from base to tip. The tendril of only the one genus, *Cucumis*, differs from the last type in possessing the characteristics of the tendril-branch throughout. By experiments on seedlings the investigator proved that in tendrils with several branches, the tendril-bearer is a transformed shoot-axis, and the tendril-branch a metamorphosed leaf; and that in simple tendrils—with the exception of *Cucumis*, which is a transformed leaf only—the base is a shoot-axis and the upper part a terminal leaf. The primitive phyllotaxy in the Cucurbitaceae is 2-ranked; it later passes into an apparent spiral arrangement by the torsion of the tip of the axis.—*Anna M. Starr*.

7165. TROLL, KARL. Öffnung und Samenentleerung an nickenden Kapselfrüchten. [Dehiscence and seed discharge in nodding capsules.] Flora 116: 346-359. Pl. 6. 1923.—In the families Ericaceae, Pyrolaceae, Campanulaceae, and Orchidaceae, there are some exceptions to the general rule that berries grow on nodding, and capsules on erect stalks. These exceptions show a correlation between the position of the stalk and the opening of the capsule. In forms with erect capsules (*Rhododendron* spp., *Campanula patula*, *Monotropa hypopitys*, *Orchis incarnatus*, *Cephalanthera grandiflora*) the opening is at the top, which seems to be a favorable position for the gradual emptying of a capsule containing small seeds. In species with nodding capsules (*Ledum* spp. *Ramischia secunda*, *Campanula medium*, *Epipactis palustre*) the opening occurs at the base of the capsule, thus bringing it to the upper side. In *Neottia nidus-avis* the capsule is horizontal with the slits on the upper side. *Nican-dra physaloides* has a nodding stalk bearing a dry capsule-like berry which opens at the base.—*A. G. Stoekey*.

7166. UPHOF, J. C. TH. Die Jugendform von *Hypericum aspalathoides*. [The juvenile form of *H. aspalathoides*.] Flora 116: 312-315. 3 fig. 1923.—Seedlings of this xerophytic shrub are compared with mature plants. The earliest leaves of seedlings are wide, the later ones narrow, while those of mature plants are needle-shaped. The structure of the broad juvenile leaf is that of a typical mesophytic leaf. The needle-shaped leaf has thickened cuticle and double palisade-cells; it is not flat, but appears winged in cross-section. The author proved experimentally that the change in form and structure depends upon sunlight.—*Anna M. Starr*.

7167. UPHOF, J. C. TH. Estudio botánico de la Yuca, *Manihot esculenta*, Crantz. [Botanical study of *M. esculenta*.] Rev. Agric. Com. y Trab. Havana 5¹²: 27-34. 10 fig. 1924.—The morphology, anatomy and biology of the flower and the biochemistry of the cassava are discussed, the varieties Plateada, Negria, Amarella and Manipeba being especially considered. There are several systems of ramification: (1) unbranched stems; (2) dichotomous ramification; (3) trichotomous ramification, and (4) dichotomous and trichotomous ramification on the same plant. The angle of the twig to the stem is also of importance in distinguishing varieties. Old and young stems, leaves and roots were examined for prussic acid, which was found most abundantly in the variety Manipeba.—*Author*.

7168. UPHOF, J. C. TH. Hygrochasic movements in floral bracts of *Ammobium*, *Acroclinium*, *Rhodanthe* and *Helichrysum*. Amer. Jour. Bot. 11: 159-163. 2 fig. 1924.—The anatomy of the floral bracts of these Composites is discussed. The reverse takes place from what has been observed in xerophytic selaginellas, the bracts closing when moistened, thus making a shelter for the flowers during rain. Movements are almost as rapid as those in leaves of *Mimosa*. During drought the thin walled tissue loses more water than the thick

walled tissue, after which the heads open again. Since the cells are deprived of living protoplasm, the cause of these movements is physical rather than biophysical. The movement of the bracts begins when the flowers are well developed. Before this time the cells of the bracts contain protoplasm and a considerable amount of moisture, and in the very young stages the walls of the upper layer of cells have no secondary layers. Later, however, the walls increase in thickness, the protoplasm disappears, and the bracts spread out upon becoming dry, thus exposing the flowers.—*Author*.

7169. WELCH, M. B. The occurrence of oil glands in the barks of certain eucalypts. *Proc. Linnean Soc. New South Wales* 47: 428-438. *Pl.* 48-49. 1922.—Secretory glands containing an essential oil are common in leaves of the Myrtaceae and Rutaceae. The author also finds them in the cortical tissue of young stems of most eucalypts, but here there is no subsequent development and they soon cease to function. The presence of essential oil glands of a secondary nature is less common but they occur in the secondary phloem of stems and roots of certain eucalypts. The author found secondarily developed oil-glands in the following species: *Eucalyptus acaciaeformis* Deane and Maiden; *E. aggregata* Deane and Maiden, *E. angophoroides* Baker, *E. Bridgesiana* Baker, *E. cinerea* F.v.M., *E. elaeophora* F.v.M., *E. Gullicki* Baker, *E. Macarthuri* Deane and Maiden, *E. maculosa* Baker, *E. nova-anglica* Deane and Maiden, *E. pulverulenta* Sims., *E. rubida* Deane and Maiden, *E. Smithii* Baker, *E. Stuartiana* F.v.M. and *E. viminalis* Labill. A large number of the species examined gave negative results (list given) so that eucalypts with secondary oil-glands in the bark are considered the exception rather than the rule.—The presence of oil glands is of value taxonomically in identifying even small stems of herbarium material.—Detailed investigations of the occurrence and development of the glands were made on *E. macarthuri*, a woollybutt, as a type. The number of glands increases with growth in diameter. An enormous development in the secondary phloem of the stems and roots of certain species was found. These schizo-lysigenous glands may be almost uniformly distributed through the outer portion of the bark or they may occur in definite zones separated by broad bands of phloem elements. They are never in close proximity to the cambium and in mature trees seldom approach within 10 mm. of this inner meristem; thus, they may be removed for distillation. They are always surrounded by thin-walled parenchyma either in a broad zone or in a ray which has spread out at that point. The contents of glands in the twigs and deep within the older bark is readily soluble in alcohol, but that of glands farther out is darker and apparently resinous and is not wholly soluble in any ordinary solvents. There is great variation among different types of eucalypts.—The oil glands are thought to serve a protective purpose rather than as a means of reducing transpiration or storing food.—*Eloise Gerry*.

7170. WILLIAMS, S. The anatomy of the branching fronds of some cultivated varieties of ferns. *Ann. Bot.* 38: 43-58. 5 fig. 1923.—The method of division in the vascular strands of a number of varieties is described and figured. In the distal region there is a simple dichotomous division of a solid, laterally extended vascular plate. In the proximal region there is generally a double normal strand and division is equal. In all cases the branchings are considered to be dichotomous though there may be a certain amount of sympodial development of the shanks.—*W. P. Thompson*.

MORPHOLOGY AND TAXONOMY OF ALGAE

E. N. TRANSEAU, *Editor*

L. H. TIFFANY, *Assistant Editor*

(See also in this issue Entries 6901, 6911, 6953, 6955, 7206, 7219, 7416, 7472, 7473, 7474)

7171. CHOLNOKY, BÉLA. Adatok a Bacillariéák coloniáinak ismeretéhez. [Contribution to the knowledge of Bacillaria-colonies.] *Folia Crypt.* 1: 3-24. *Pl. I*, 2 fig. 1924.—The article is in Hungarian with a brief German résumé of which the following abstract is a translation. Epiphytic Bacillariae, especially those forming colonies, can adhere only to algal threads which possesses apical growth or which have scattered portions of the cell walls

incapable of elongation. As far as the species of *Diatoma* and *Gomphonema* go, rhythmic cell-division does not occur, the intervals between individual mitoses being of varying duration. The stalks are dissimilar and, in the species studied, fall into 2 structural forms, that of *Cymbella* and that of *Gomphonema*. In stalks of the *Cymbella* type the nodes are the traces of the individuals which have freed themselves from the parent colony; in the *Gomphonema* type the stalk consists of 2 divisions, corresponding to the valves, bound together by a lamella. The appearance and development of the colonies are specifically characteristic; therefore there can be no question of aggregates in the cases studied.—E. B. Chamberlain.

7172. DREW, KATHLEEN M. An abnormal pro-embryonic branch of *Chara vulgaris* L. Ann. Bot. 38: 207-209. 2 fig. 1924.—The tip of the pro-embryo was not the normal cell row of limited growth but had undergone divisions like the apical cell of a shoot.—W. P. Thompson.

7173. FREMY, P. Contribution à la flore algologique de l'Afrique équatoriale française. [An algal flora of French Equatorial Africa]. (To be contd.) Rev. Algologique 1: 28-49. Pl. 3, fig. 1-7. 1924.—The material reported upon was collected by M. Georges Le Testu in or near Haute-Kotto. In this part, 32 Myxophyceae are listed with notes on their occurrence. New species, varieties, and forms are: *Schizothrix Bioreti* n.sp., near *S. Friesii*, *S. purpurascens* Gomont f. *fasciculata* and f. *pulvinata* n. f.; *Symploca muscorum* Gomont var. *fusca* n.var., *Calothrix minima* n.sp.; *C. cylindrica* n.sp.; *Dichothrix Orsiniana* Bornet and Flahault var. *Africana* n.var.; *Gloeotrichia Le-Testui* n.sp., near *G. Pilgeri* Schmidle; *Westiella lanosa* n.sp. near *W. intricata* Borzi; *Stigonema La-Vardei* n.sp., near *S. mamillulosum* Ag.; *Scytomema pulchrum* n.sp., near *S. myochrous* Ag.—Wm. Randolph Taylor.

7174. HAMEL, G. Sur l'apparition d'une algue nouvelle sur les Côtes de Bretagne et de Normandie, *Antithamnionella sarniensis* Lyle. [A. sarniensis, a new alga on the coasts of Brittany and Normandy.] Rev Algologique 1: 50-52. 1924.—A. sarniensis, sterile or occasionally in tetrasporic fruit, is frequent on these coasts, and seems to be a comparatively recent introduction.—Wm. Randolph Taylor.

7175. MANGIN, L. La revue algologique. [The "Revue Algologique."] Rev. Algologique 1: 1-3. 1924.—This is a description of the importance of algal studies and of the new journal.—Wm. Randolph Taylor.

7176. MANN, ALBERT. Suggestions for collecting and preparing diatoms. Proc. U. S. Nation. Mus. 60¹⁵: 1-8. 1922.

7177. STEINER, H. Das Plankton des Pheneos-See. [The Plankton of Lake Pheneos. Special contribution in "Flora und Vegetation von Kreta und Griechenland by M. RIKLI UND E. RUEBEL." Vierteljahrsschr. Naturforsch. Ges. Zurich 68: 179-183. 1923.—This lake is unusually poor in plankton species. Nine species of plants and 10 of animals are listed. The plant list follows: *Fragilaria crotonensis* Kitton., *Tabellaria fenestrata* Kuetz. v. *asterionelloides* Grün., *Staurastrum gracile* Ralfs., *Cosmarium* sp., *Eudorina elegans* Ehrbg., *Pediastrum boryanum* Menegh., *Closterium acerosum* Ehrbg., *Dinobryon divergens* Imh., *Ceratium hirundinella* O. F. M. f. *gracile*.—John H. Schaffner.

7178. STURCH, H. H. On the life history of *Harveyella pachyderma* and *H. mirabilis*. Ann. Bot. 38: 27-42. 22 fig. 1924.—Both species are algal parasites belonging to the Florideae, *H. pachyderma* growing on *Gracilaria confervoides*, and *H. mirabilis* on *Rhodomela subfusca*. Both pass through the full ordinary Floridean life-cycle twice a year in deep water, at least 10 fathoms below the low-water mark. Near the low-water mark they pass through the cycle once between October and May, during the rest of the year disappearing entirely from shallow water. The 2 species resemble each other closely in habit, external morphology, and somatic details but differ in the carpogonial branch, in all the details of nourishment of the ooblastema, in the mechanism of ooblastema fusion, and in the occurrence of secondary fusions. They have acquired their points of similarity partly by the reduction associated with the parasitic habit. Fundamentally they are sufficiently distinct to be placed in different genera.—W. P. Thompson.

7179. SVEDELIUS, NILS. Zur Kenntnis der Gattung *Neomeris*. [The genus *Neomeris*.] Svensk. Bot. Tidskr. 17: 449-471. Fig. 1-9. 1923.—The work deals principally with *Neomeris annulata* Dickie, material of which had been collected in the Paumben-channel at Ceylon. Specimens from this locality agree in shape with those from Bermuda and Mada-

gascar but differ from specimens taken in the formerly Danish West-Indies. The Ceylon form lacks the well-marked stipes of the West-Indian material. The long central cell of the plant contains a parietal plasma layer with many nuclei. The primary branches get one nucleus each which later divides. Each branch carries 2 secondary branches, but there seems to be no typical dichotomy. Gametangia appear below the angle between 2 secondary branches but are later displaced so as to occupy an apparently apical position. The difference between the Dasycladeae with apical, and the Bornetelleae with lateral gametangia can thus not be maintained. The author agrees with Pia in dividing the Dasycladaceae into Dasycladeae and Neomereae (besides the Acetabulariae). In the gametangia 1 single cysta is found, surrounded by a wall and containing originally but 1 nucleus which later divides and gives rise to about 50 nuclei, lying in a parietal layer of dense plasma. Notes are given on the structure of the operculum in the wall, and an occasional bifid gametangium is described. The genus *Neomeris* has a discontinuous geographical distribution. Six "good" species are known from the Indian and Pacific oceans, especially from the Malay Archipelago and from the West Indies and Bermuda—all localities except the last lying within the tropics. *Neomeris annulata* and *N. dumetosa* Lamour occur in both of these districts, the other species only in one of them. *Neomeris* is a new instance of a genus, the geographical distribution of which cannot be explained without assuming that the Panama isthmus has been open in relatively late times.—O. Heilborn.

7180. W., H. Morphological constituents of algal cells. [Rev. of: MANGENOT, G. Archives de morphologie générale et expérimentale. Fasc. 9. Recherches sur les constituants morphologiques du cytoplasma des algues. (Researches on the morphological constituents of algal cytoplasm). ix + 330 p., 16 pl. Gaston Doin: Paris, 1922.] Nature 113: 155-156. 1924.

7181. WALTER, HEINRICH. Zur Biologie der *Bangia fusco-purpurea* Lyngb. Flora 116: 316-322. 6 fig. 1923.—Peculiar, deformed cells single or in groups, are of common occurrence in *Bangia fusca-purpurea*. This alga grows at tide-levels in the vicinity of springs where it is exposed to a great range of concentration. A series of experiments with cultures in sea water, rain water, a concentrated solution of NaCl and an alternation of the last 2; showed that the change from a highly concentrated solution to rain water may cause the collapse of a single cell or a group of cells, and that the disturbance tends to progress in both directions along the filament. Under favorable conditions regeneration may occur, living cells pressing through the dead cells.—A. G. Stokey.

MORPHOLOGY AND TAXONOMY OF BRYOPHYTES

ALEXANDER W. EVANS, *Editor*

(See also in this issue Entries 6963, 7206, 7416, 7472, 7473, 7474, 7483, 7484)

7182. AMANN, J. Le *Bryum Schleicheri* Schwägr. Rev. Bryologique 51: 20-22. 1924.—The author's earlier observations on *Bryum Schleicheri* [see Bot. Absts. 12, Entry 1936] are here extended by the study of 3 extra-European specimens. The 1st came from the Caucasus Mountains, the 2nd from Chile (distinguished as forma *heterophylla* by Thériot), and the 3rd from Kerguelen Island (distinguished as *B. flaccidissimum* by Cardot and Thériot). The conclusion is reached that all 3 specimens are clearly referable to *B. Schleicheri*. The species is thus holarctic in its distribution, and 15 other mosses belonging to the same category are listed.—A. W. Evans.

7183. BROTHERUS, V. F. Die Laubmoose Fennoskandias. [Mosses of Finland and Scandinavia.] Flora Fennica 1. 8 vo. xiii + 635 p., 118 fig. Helsingfors, 1923.—This important work on the mosses of Finland, Norway and Sweden was published under the auspices of the Societas pro Fauna et Flora Fennica and largely at the expense of the Finnish government. After a short account of the morphological features of the group the author gives full descriptions of the 827 species definitely known from the region under investigation, the Sphagnales being omitted. He likewise characterizes the genera and higher groups and inserts analytical keys wherever necessary. He follows the arrangement recently proposed

by Fleischer [see Bot. Absts. 13, Entry 6643], first dividing the mosses into the subclasses Andreaeales, with the single family Andreaeaceae (1 genus, 14 species), and the Bryales, with 3 order groups and 14 orders. These orders are arranged in the following sequence: Fissidentales, with the family Fissidentaceae (1 genus, 14 species); Dicranales, with the families Archidiaceae (1 genus, 1 species), Ditrichaceae (6 genera, 14 species), Seligeriaceae (3 genera, 12 species), Dicranaceae (22 genera, 79 species), and Leucobryaceae (1 genus, 1 species); Pottiales, with the families Pottiaceae (23 genera, 84 species) and Encalyptaceae (1 genus, 9 species); Grimmiales, with the family Grimmiaceae (3 genera, 43 species); Funariales, with the families Disceliaceae (1 genus, 1 species), Ephemeraceae (1 genus, 4 species), Funariaceae (4 genera, 9 species), Oedipodiaceae (1 genus, 1 species), and Splachnaceae (4 genera, 16 species); Schistostegales, with the family Schistostegaceae (1 genus, 1 species); Tetraphidales, with the family Georgiaceae (2 genera, 2 species); Eubryales, with the families Bryaceae (8 genera, 169 species), Mnaceae (2 genera, 26 species), Aulacomniaceae (1 genus, 3 species), Meeseaceae (3 genera, 5 species), Catosciaceae (1 genus, 1 species), Bartramiaceae (5 genera, 12 species), and Timmiaceae (1 genus, 4 species); Isobryales, with the families Ptychomitriaceae (2 genera, 2 species), Orthotrichaceae (4 genera, 50 species), Fontinalaceae (2 genera, 13 species), Climaciaceae (1 genus, 1 species), Hedwigiaceae (2 genera, 2 species), Leucodontaceae (3 genera, 3 species), Neckeraceae (3 genera, 8 species), and Lembophyllaceae (1 genus, 3 species); Hookeriales, with the family Hookeriaceae (1 genus, 1 species); Hypnobryales, with the families Leskeaceae (5 genera, 10 species), Thuidiaceae (3 genera, 11 species), Pseudoleskeaceae (3 genera, 9 species), Amblystegiaceae (11 genera, 58 species), Brachytheciaceae (9 genera, 49 species), Fabroniaceae (2 genera, 2 species), Entodontaceae (4 genera, 7 species), Plagiotheciaceae (2 genera, 16 species), Sematophyllaceae (1 genus, 1 species), Hypnaceae (6 genera, 21 species), and Hylocomiaceae (4 genera, 10 species); Buxbaumiales, with the family Buxbaumiaceae (1 genus, 1 species); Diphysciales, with the family Diphysciaceae (1 genus, 1 species); and Polytrichales, with the family Polytrichaceae (5 genera, 22 species). The first 11 orders are in the order-group Eubryinales, the 12th and 13th in the Buxbauminales, and the last in the Polytrichinales. No new species are proposed but the following reductions of species to subspecific or varietal rank are indicated, subspecies being designated by asterisks: *Amblystegium trichopodium* var. *curvipes* (Gümb.), based on *A. curvipes* Gümb.; *Barbula rigidula* var. *valida* (Limpr.), on *Didymodon validus* Limpr.; *Bryum bicolor* **B. Arvenii* (Arn.), on *B. Arvenii* Arn.; *B. finmarkianum* var. *lutescens* (Bomans.), on *B. lutescens* Bomans.; *B. inclinatum* var. *stenotheca* (Bomans.), on *B. stenotheca* Bomans.; *B. Moei* var. *angustifolium* (Kaur.), on *B. angustifolium* Kaur.; *Campylium hispidulum* var. *stragulum* (Hag.), on *Hypnum stragulum* Hag.; *Ceratodon purpureus* **C. conicus* (Hampe), on *Trichostomum conicum* Hampe; *C. purpureus* **C. dimorphus* (Philib.), on *C. dimorphus* Philib.; *Fissidens bryoides* var. *viridulus* (Sw.), on *Dicranum viridulum* Sw.; *Hygrohypnum ochraceum* var. *simplicinerve* (Lindb.), on *Amblystegium simplicinerve* Lindb.; *Hypnum cupressiforme* **H. resupinatum* (Wils.), on *H. resupinatum* Wils.; *H. pallescens* **H. protuberans* (Brid.), on *H. protuberans* Brid.; *Isopterygium pulchellum* var. *nitidulum* (Wahlenb.) on *Leskea nitidula* Wahlenb.; *Kiaeria Blyttii* var. *riparia* (Lindb. f.), on *Oncophorus riparius* Lindb. f.; *Orthotrichum speciosum* var. *elegans* (Schwaegr.), on *O. elegans* Schwaegr.; and *Pylaisia polyantha* var. *suecica* (Br. eur.), on *Thedenia suecica* Br. eur. The following new specific combinations are likewise proposed (together with 2 new subspecific and 35 new varietal combinations): *Amblystegiella alpicola* (Lindb.), based on *Stereodon alpicola* Lindb.; *Calliergon solitarium* (Hag.), on *Hypnum solitarium* Hag.; *Camptothecium trichoides* (Neck.), on *H. trichoides* Neck.; *Cirriphyllum filiforme* (Lam.), on *H. filiforme* Lam.; *Cratoneurum glaucum* (Lam.), on *H. glaucum* Lam.; *Hygrohypnum rivulare* (Sw.), on *Hypnum rivulare* Sw.; *Isopterygium pulchellum* (Dicks.), on *H. pulchellum* Dicks.; *Kiaeria Blyttii* (Schimp.), on *Dicranum Blyttii* Schimp.; *Pottia Davalliana* (Sm.), on *Gymnostomum Davallianum* Sm.; and *Pterygoneurum pusillum* (Hedw.), on *Bryum pusillum* Hedw. The figures, drawn by J. Pohl, represent characteristic species of the various genera.—In connection with each species the author gives the local distribution in detail and also indicates the general distribution. Of the 827 species recognized, 188 are known from Europe only, 97 being endemic to the region studied; 71 of the endemics are in the vast genus *Bryum*, under which 135 species

in all are recognized. The species not confined to Europe make up more than 75% of the entire moss flora and are mostly of wide circumpolar or even cosmopolitan distribution, 545 being known also from North America, 477 from Asia, 177 from Africa, 31 from Australasia, and 25 from South America.—A. W. Evans.

7184. CORNET, A. Découverte de trois espèces nouvelles pour la flore belge. [Discovery of three species new to the Belgian flora.] Bull. Soc. Roy. Bot. Belgique 54: 150-154. 1921.—The species in question are mosses and were discovered by the author. They are as follows: *Brachythecium reflexum* Br. Eur., at Juslenville; *Sphagnum subtile* (Russ.) Warnst., at Cokai-fagne; and *Webera prolifera* (Lindb.) Kindb., at Winamplanche. Each species is characterized, and a key is given to distinguish the *Webera* from 3 other closely related species of the Belgian flora.—A. W. Evans.

7185. CORNET, A. Sur une forme polygame du *Fissidens rufulus* Br. Eur. [A polygamous form of *Fissidens rufulus*.] Bull. Soc. Roy. Bot. Belgique 55: 71-72. 1923.—The author reports the discovery by Halin of a polygamous form of *Fissidens rufulus* at Goé, Belgium, the species being usually dioicous. He shows that this polygamous form bears the same relation to the typical form that the polygamous *F. Mildeanus* Schimp. bears to the dioicous *F. crassipes* Wils. and expresses the opinion that too much emphasis has been laid on the inflorescence in separating species of *Fissidens*.—A. W. Evans.

7186. CULMANN, P. Contribution à la flore bryologique du bassin supérieur du Salat (Ariège) Pyrénées centrales. [The moss flora of the upper valley of the Salat (Ariège), Central Pyrenees.] Rev. Bryologique 51: 23-27. 1924.—During the late summer of 1923 the author collected bryophytes in the vicinity of Angouls, Province of Ariège, France. The region studied is in the Central Pyrenees and varies in altitude from 550 to 2100 m. In the present paper, which is the 1st of a series, he enumerates the hepatics of his collection (87 in number), giving in each case full data regarding stations. The mosses will be considered later.—A. W. Evans.

7187. CULMANN, P. *Tortella fasciculata* subspecies nova. Rev. Bryologique 51: 22-23. 1924.—Under the above name the author proposes a new subspecies of *T. tortuosa* (L.) Limpr. It is based on specimens which he collected at various localities in the upper valley of the Salat in the Province of Ariège, France.—A. W. Evans.

7188. DISMIER, G. Notes sur le groupe *Pottia Starkeana-minutula* et sur la présence aux environs de Paris du *Pottia mutica* Vent. [Notes on the *Pottia Starkeana-minutula* group and on the occurrence of *P. mutica* in the vicinity of Paris.] Rev. Bryologique 51: 16-19. 1924.—This group of the *Pottia* includes *P. Starkeana* (Hedw.) C. M., *P. minutula* (Schleich.) Furnr., *P. mutica* Vent., and *P. commutata* Limpr.; the author reviews the recent work of Corbière, in which the species are distinguished mainly by differences in spore-markings. Although *P. Starkeana* and *P. minutula* have a wide European distribution, *P. mutica* is much more circumscribed, and a new French station, Liancourt in the department of the Oise, is recorded. The author is inclined to regard *P. commutata* as a subspecies of *P. minutula*, instead of reducing it to a variety as was done by Corbière. It seems to be restricted to the Mediterranean region and is here recorded for the 1st time from Africa, on the basis of specimens collected by Balansa at Oran, Algeria.—A. W. Evans.

7189. DIXON, H. N., AND L. RODWAY. On *Phascum tasmanicum*. Papers & Proc. Roy. Soc. Tasmania 1923: 25-26. 1 fig. 1923.—The authors describe and figure a new moss, *Phascum tasmanicum* n.sp.; it is related to *P. Floerkeanum* Web. & Mohr.—A. W. Evans.

7190. EVANS, ALEXANDER W. The Chilean species of *Metzgeria*. Proc. Amer. Acad. Arts and Sci. 58: 269-324. 10 fig. 1923.—The author gives a detailed presentation of the 11 species of *Metzgeria* which he recognizes as members of the Chilean flora, with a key to the species, illustrations and citations of the literature. Two of the species, *M. divaricata* and *M. epiphylla*, are proposed as new. The others are as follows: *M. chilensis* Steph., *M. corralensis* Steph., *M. decrescens* Steph., *M. decipiens* (Massal.) Schiffn. & Gottsche, *M. frontipilis* Lindb., *M. hamata* Lindb., *M. magellanica* Schiffn. & Gottsche, *M. patagonica* Steph., and *M. violacea* (Ach.) Dumort. A number of reductions to synonymy are likewise indicated, *M. Lechleri* Steph. being included under *M. corralensis*; *M. Dusenii* Steph., *M. longiseta* Steph. and *M. terricola* Steph. under *M. decrescens*; *M. glaberrima* Steph. and *M. nuda* Steph. under *M. decipiens*; *M. brevialata* Steph. under *M. frontipilis*; *M. australis* Steph.

and *M. nitida* Mitt. under *M. hamata*; and *M. antarctica* Steph. under *M. violacea*.—John H. Schaffner.

7191. GARDET, G. Notes sur quelques muscinées. [Notes on certain bryophytes.] Rev. Bryologique 51: 27-28. 1924.—Two bryophytes, *Neckera turgida* Jur. and *Lophozia barbata* (Schmid.) Dum., are here discussed, both having been observed by the author in the vicinity of Langres, Province of Haute-Marne, France. Some of the *N. turgida* represents the var. *mediterranea*, but this passes insensibly into the more typical form of the species. *L. barbata* is the predominant hepatic on certain calcareous rocks.—A. W. Evans.

7192. GYÖRFFY, I. A "Bryophyta regni Hungariae exsiccata" részére begyűjtött és Kolozsvárott rekedt fajok jegyzéke. [Schedule of the material collected for the "Bryophyta regni Hungariae exsiccata" but left in Kolozsvár.] Folia Crypt. 1: 25-40. 1924.—The author states that between 1914 and 1919 he, with the late M. Péterfi [see Bot. Absts. 13, Entry 1414], had collected 989 numbers of bryophytes for distribution in a series to be known as Bryophyta regni Hungariae exsiccata. In May, 1919, this material, at Kolozsvár (Klausenburg), was forcibly seized and the authors evicted. Since parts of the collection are now being distributed under the title "Flora Romaniae exsiccata," the author here gives a complete list of the species originally represented with data regarding stations, prepared from his field notebooks. This list includes 253 mosses, 64 hepatics, and several species not definitely determined. The paper is written in Hungarian and German.—E. B. Chamberlain.

7193. HERZFELDER, HELENE. Experimente an Sporophyten von *Funaria hygrometrica*. [Experiments on the sporophytes of *F. hygrometrica*.] Flora 116: 476-490. 5 fig. 1923.—In an earlier paper bearing the same title [see Bot. Absts. 11, Entry 2666] the author showed that the sporophyte of *F. hygrometrica*, if deprived of its calyptra, developed a swollen seta and an approximately radial capsule. In the present paper the attempt is made to explain the causes of these deviations from normal development, and the conclusion is reached that the swollen seta and the radial structure of the capsule are not due to the same cause. The swelling of the seta is attributed to the removal of an inhibitory influence exerted by the closely adhering calyptra. In connection with the radial structure of the capsule it is shown that sporophytes without calyptras exhibit a more strongly marked and more persistent negative geotropism than normal sporophytes, and the assumption is made that the increased geotropic response stands in a causal relation to the change in the symmetry of the capsule. Experiments with sporophytes removed from the gametophytes and cultivated on nutrient agar showed that those without calyptras grew more vigorously and were better able to develop capsules than those still covered; they showed also a greater activity in producing protonema by regeneration. The leafy gametophytes produced on the diploid protonema were much like haploid gametophytes in appearance. Their antheridia, however, were about 50% larger, and the paraphyses with them were frequently abnormal in form.—A. W. Evans.

7194. MILSOM, F. E. Yorkshire bryologists at Grassington. Naturalist 1924: 95. 1924.—A record of the mosses and liverworts seen in the vicinity of Grassington, England, is given.—W. H. Burrell.

7195. MURRAY, JAMES. Hepaticae of Carlisle district. Naturalist 1924: 157-158. 1924.—The list includes 6 species not cited for Cumberland (v.c. 70), England, in the Census Catalogue.—W. H. Burrell.

7196. MURRAY, JAMES. Some Cumberland mosses. Naturalist 1923: 409. 1923.—The author gives a list of 9 species and varieties new to the flora of Cumberland, England.—W. H. Burrell.

7197. NEGRI, GIOVANNI. Contributo alla briologia della Cirenaica. [The bryology of Cyrenaica.] Atti Accad. Sci. Torino 57: 586-591. 1922.—The author gives a report on a collection of mosses made by E. Festa in the Italian colony of Cyrenaica in northern Africa. The species listed include 44 Acrocarpi and 8 Pleurocarpi, 26 of the Acrocarpi (but none of the Pleurocarpi) being known also from the neighboring colony of Tripoli. Of the 7 species previously known from Cyrenaica, 4 do not occur in the present collection, so that the total number of mosses recorded from the colony is 56. No new species are proposed.—A. W. Evans.

7198. VAN DEN BROECK, H. Note sur la découverte en Belgique de l'*Anomodon apiculatus* Br. Eur. [Discovery of *Anomodon apiculatus* in Belgium.] Bull. Soc. Roy. Bot. Belgique 55: 28. 1923.—This 1st Belgian record for *Anomodon apiculatus* is based on specimens collected by V. Lambert at Onoz-Spy near Namur. The species is briefly described.—A. W. Evans.

7199. VAN DEN BROECK, H. Note sur la découverte du *Desmatodon cernuus* Br. et Sch., espèce nouvelle pour la flore belge, dans la campine auvertoise. [Discovery of *D. cernuus*, a species new to the Belgian flora, in the plain of Antwerp.] Bull. Soc. Roy. Bot. Belgique 55: 57-58. 1923.—Although *Desmatodon cernuus* is usually found at high elevations the author reports its discovery at Schoolen, near Antwerp, Belgium, only a few feet above sea-level. The distinctive features of the species are noted.—A. W. Evans.

MORPHOLOGY AND TAXONOMY OF FUNGI, LICHENS, BACTERIA, AND MYXOMYCETES

H. M. FITZPATRICK, *Editor*

D. S. WELCH, *Assistant Editor*

(See also in this issue Entries 6938, 7276, 7278, 7285, 7393, 7394, 7395, 7416, 7472, 7473, 7474, 7483, 7497)

FUNGI

7200. ABBOTT, SARAH R. Clavariaceae—coral fungi and fairy clubs. Maine Nat. 2: 170-171. 2 pl. 1922.—Notes on 4 genera of this group are given.—C. A. Weatherby.

7201. ABBOTT, SARAH R. Mushrooms. Maine Nat. 2: 26-29. 2 pl. 1922.—A list of 50 species found in the Knox Arboretum, Aug. 23, 1921, is given.—C. A. Weatherby.

7202. ADAMS, J. F. Gametophytic development of blister rusts. Bot. Gaz. 71: 131-137. 4 fig. 1921.—A comparison is made of the interval of time consumed in completing the gametophytic development in some of the rusts on Angiosperms and in the stem rusts on some of the Gymnosperms. In the case of rusts on Gymnosperms there are at least 3 methods of seasonal interval in the sequence of pycnia and aecia. (1) *Peridermium cerebrum* takes 2 years to complete the gametophytic period of development on any given infected area. (2) In *Peridermium Comptoniae* and *P. pyriforme* maturity of the pycnia precedes that of the aecia in adjacent as well as in the overlying tissue within a period of about 6 months. (3) In the leaf rusts of conifers, the gametophytic period of development is completed within 1 growing season, as in *Peridermium acicolum* and *P. Peckii*. A method is discussed for differentiating *P. cerebrum* and *P. Comptoniae* when found in the immature stage or too far past maturity for the aecial characters to be depended upon.—Author.

7203. ASHBY, S. F. Oospores in cultures of *Phytophthora faberi*. Kew Bull. 1922: 257-262. 1922.—This fungus is the cause of pod rot, patch canker, and chupon wilt of cacao and has been found in most tropical places where the tree is cultivated. It has frequently been isolated in pure cultures on a variety of media without obtaining oospores. Related species, which attack the coconut palm, do not develop oospores in pure culture and the same observation applies to a *Phytophthora* obtained from rotting cotton bolls. When mixed cultures are propagated oospores are found in all mixtures containing the cacao *Phytophthora*. The sexual spores were of the *P. infestans* type when obtained from mixtures of the cacao fungus with 2 coconut cultures and the cotton boll culture. The mean size and variation of the oospores were approximately the same in all combinations of cacao with the others except where the coconut culture was given a precedence of 2 days, in which event the oospores were on the average smaller than when the inoculations were simultaneous. Efforts to germinate the oospores have been unsuccessful. Oospores of the same type, mean size, and variation are formed in all mixed cultures of the cacao *Phytophthora* both with closely related forms and with an unrelated species such as *P. parasitica* isolated from *Ricinus communis*. This indicates that the oospores are those of *P. faberi*, which normally have a mean diameter of 23.1-23.6 μ and a variation of 17.8-28.6 μ , being larger than those of *P. parasitica*.—T. J. Fitzpatrick.

7204. BISBY, G. R. **Fungi from central Manitoba.** *Mycologia* 16: 122-129. 1924.—A list is given of 118 species of fungi collected near Norway House, Manitoba. Notes are given on the region and on certain of the fungi. *Puccinia graminis* had apparently been carried there by the wind.—*Author*.

7205. BRÜYN, HELENA L. G. DE **Oospores of *Phytophthora infestans* (Mont.) de By.** Rept. Internat. Conf. Phytopath. and Econ. Entomol. Holland P. 30-31. H. Veenman & Sons: Wageningen, 1923.—Oospores of the potato blight fungus were produced in culutres on corn meal and oat meal agar, on raw potato, and on sterilized soil and sterilized manure.—*F. Weiss*.

7206. BURNHAM, STEWART H., AND ROY A. LATHAM. **The flora of the town of Southold, Long Island and Gardiner's Island, New York (Fourth Supplementary List).** *Torreyia* 24: 22-32. 1924.—This list adds to those already published in *Torreyia* the following species and varieties: 2 insect-galls, 5 slime-molds, 1 alga, 122 fungi, 1 lichen, 1 hepatic, 5 mosses, 1 fern, and 33 flowering plants. Notes on habitat and station are given. One new combination is made: *Blastenia ferruginea* (Huds.) Arn. var. *discolor* (Wiley) Burnham & Latham.—*J. C. Nelson*.

7207. CUNNINGHAM, G. H. ***Aseroe rubra*, an interesting New Zealand phalloid.** *New Zealand Jour. Sci. and Tech.* 6: 154-157. 4 fig. 1923.—*Aseroe rubra* is common in New Zealand lowland forest. An account of its morphology is followed by a criticism of Buller's view that the plant is insectivorous. The bright-red color and strong odor attract insects, particularly blow-flies, which feed on the gleba and disseminate the spores.—*H. H. Allan*.

7208. CUNNINGHAM, G. H. ***Clathrus cibarius*, the "bird-cage" fungus.** *New Zealand Jour. Sci. and Tech.* 5: 247-250. 4 fig. 1922.—This is a description of the morphology and life-history of the fungus.—*H. H. Allan*.

7209. CUNNINGHAM, G. H. **Relation of biologic specialization in the taxonomy of the grass-rusts.** *New Zealand Jour. Sci. and Tech.* 6: 157-166. 1923.—This is a plea, supported by an analysis of the treatment of 4 cereal rusts, against accepting "biologic specialization" as a specific character.—*H. H. Allan*.

7210. CUNNINGHAM, G. H. ***Sphaerobolus stellatus* Tode.** *New Zealand Jour. Sci. and Tech.* 6: 16-19. 6 fig. 1923.—The structure of the fructifications and the method of spore-dissemination are described.—*H. H. Allan*.

7211. DOUGLAS, GERTRUDE E. **Early development of *Inocybe*.** *Bot. Gaz.* 70: 211-220. Pl. 18-22. 1920.—The early development of *Inocybe* is similar to that of other endogenous Agaricaceae. Within the young buttons of fundamental tissue are early organized dome-shaped growth regions. By progressive differentiation the stem fundament is formed, then the pileus, leaving the ground tissue on the outside as the universal veil, which ultimately becomes lost. The cobwebby hairs, characteristic of the genus *Inocybe*, are due to this disappearing structure. The gills develop according to the method described by Atkinson and others for other agarics, on ridges which develop centrifugally from the stem.—*Author*.

7212. DURAND, ELIAS J. **The genera *Midotis*, *Ionomidotis*, and *Cordierites*.** *Proc. Amer. Acad. Arts and Sci.* 59: 3-18. Pl. 1-2. 1923.—This presentation includes keys to the species of these discomycetous genera, and descriptions of the following new species with localities: *Midotis occidentalis* Durand, Jamaica; *M. infundibuliformis* Durand, Trinidad; *Ionomidotis chilensis* Durand, Chile; *I. nicauraguensis* Durand, Nicaragua; *I. urceolata* Durand, Florida.—*John H. Schaffner*.

7213. FITZPATRICK, H. M. **The genus *Fracchiacea*.** *Mycologia* 16: 101-114. 1 pl. 1924.—The genus *Fracchiacea* was found to belong to the Nitschkieae. Thirty species and varieties of *Fracchiacea* have been described; of these, 10 are found not to belong to the genus, 4 remain doubtful, and 16 are considered as belonging to the species *F. heterogenea* Sacc. This species is redescribed, and notes are given on the excluded forms.—*G. R. Bisby*.

7214. FÖEX, ET. **Quelques faits relatifs aux Erysiphacees.** [Some facts concerning the Erysiphaceae.] Rept. Internat. Conf. Phytopath. and Econ. Entomol. Holland. P. 184-190. H. Veenman & Sons: Wageningen, 1923.—There are 4 types of conidiophores: (1) The basal cell is also the generative cell (*Erysiphe graminis* and others); (2) a basal cell bears a generative cell which bears the conidia (*E. Polygoni*); (3) an elongated conidiophore bears a single conidium only (*Phyllactinia corylea*); (4) a multicellular pedicel forms conidiophores

by budding (*E. taurica*). Although these characters are subject to considerable variation, the following are fairly constant and may have determinative value: (1) Number of cells in the complete chain; (2) proportion and form of various elements of the conidiophore; (3) facility of disarticulation; and (4) parts of the conidiophore thereby detached.—The conidia are extremely susceptible to unfavorable conditions. Germination takes place at the surface of liquids between 5° and 30°C.—Perithecia may be formed on all hosts in some species, on some hosts and not on others in other species. An equilibrium between perithecial production and conidial production appears to exist. Some species run to conidial production, others to perithecial production, others produce both in similar quantities.—The *Erysiphaceae* do not develop under very humid conditions, but are susceptible to extreme dryness.—*Harry Braun*.

7215. FRAZIER, WILLIAM C. An outbreak of moldy bread. *Baking Technology* 2: 184-187. 1923.—A peculiar and striking epidemic of mold occurred in an up-to-date bakery, which apparently was in a sanitary condition in every way. Wrapping was done by hand, but the loaves were never touched in the process. Two kinds of flour were being used; one a green flour, the other older. Three samples of green flour showed 50 to 100 molds per gm., while the 4th sample showed a total of 11,000 molds, per gm., and of at least 3 different genera. Apparently the mold spores survived the heat of the baking ovens at a certain point in the load, namely, at the crease where the upper portion bulges out over the rim of the baking pan and which apparently remains underbaked. This was thought to be due to the rapid heating of the pan rim, the consequent rapid drying of the dough at this point, the absorption of water by this incompletely baked portion during the cooling process, and rapid germination of the mold spores and spread of the mold thereafter. The bread was wrapped in waxed paper which kept the moisture in and also prevented rapid cooling.—*Carleton R. Ball*.

7216. HINES, LAWRENCE E. Studies on the identification of *Monilia psilosis*. *Jour. Infect. Diseases* 34: 529-535. 1924.—The morphological and physiological characteristics of old strains of *Monilia psilosis* were not sufficiently distinctive to differentiate them from closely related non-pathogenic fungi.—*R. L. Starkey*.

7217. HOWKINS, E. M. *Omphalia pseudoandrosacea* etc. in Yorkshire. *Naturalist* 1924: 18. 1924.—*O. pseudoandrosacea*, not previously recorded for the county, was found near Doncaster *Erysiphe tortilis* Fr. was reported parasitizing *Cornus sanguinea*.—*W. H. Burrell*.

7218. JACKSON, DOROTHY J. Bionomics of weevils of the genus *Sitona* injurious to leguminous crops in Britain. *Ann. Appl. Biol.* 9: 93-115. 1922.—*Botrytis bassiana* (Balsam.) Montagne is said to be a destructive parasite which attacks the adults and larvae of *Sitona* spp. weevils attacking clover, lucerne (alfalfa), medick (*Medicago lupulina*) and sometimes peas.—*E. C. Stakman*.

7219. LA RUE, CARL D. Isolating single spores. *Bot. Gaz.* 70: 319-320. 1920.—A mechanical device, used for cutting out spores from an agar plate, consists of a metal tube fitted at one end with a thread for screwing into the nose-piece in place of one objective; the other end is sharpened to a cutting edge. The spore to be isolated is located and centered under the objective. The nosepiece is then revolved bringing the cutting edge of the tube over the spore, and the nosepiece is lowered so that the tube cuts out a disc of agar containing the spore. The disc is then transferred with a needle. Where it is desirable to measure the spores they are spread in a thin layer of agar on a glass slide, measured, then cut out and transferred in the manner described.—*Author*.

7220. MASON, F. A. *Geaster rufescens* var. *minor* Pers. in Yorkshire. *Naturalist* 1924: 45-47. *Fig. 1-3*. 1924.—This variety, found in a garden at Roundhay, Leeds, is rare in Britain, being previously known only in Herefordshire and Norfolk. Microscopic characters are given and the habitat is discussed.—*W. H. Burrell*.

7221. MILES, L. E. Leaf spots of the elms. *Bot. Gaz.* 71: 161-196. *Pl. 8-10, 1 fig.* 1921.—*Gnomonia ulmea* (Schw.) Thüm., cause of the most common elm leaf spot in America, occurs throughout the entire range of its normal host plant, *Ulmus americana*. It is found also on *Ulmus fulva*, *U. alata*, *U. crassifolia*, and *U. racemosa*, but has not been reported attacking any foreign species of elm. In early spring the perithecial stage begins its development in the living leaf under the subcuticular stroma. An ascogonium is formed. The

young perithecium contains an intrafascicular pseudoparenchyma. The ascospores germinate only when in connection with the living leaf of the host. They do not germinate on leaves of English or Scotch elms. The conidial stage, *Gloeosporium ulmeum* sp. nov., is described for the first time. The connection between the 2 constantly associated stages was proved by inoculation. Another *Gloeosporium*, similar in many respects but not in association with a *Gnomonia* stage, is described as a new species, *Gloeosporium ulmicolum* sp. nov. Other leaf spots of the elm, including the common spot of the European elms in Europe caused by *Systemma ulmi* (Schleich.) Thiess, and Syd. which has been much confused in the literature with the American leaf spot caused by *Gnomonia ulmea* (Schw.) Thüm., are briefly discussed.—*Author*.

7222. MURRILL, W. A. **Kashmir fungi.** *Mycologia* 16: 133. 1924.—Many of the larger fungi collected by R. R. Stewart in Kashmir, India, were found to be identical with species found in New York.—*G. R. Bisby*.

7223. MURRILL, W. A. **Lake Placid fungi.** *Mycologia* 16: 96-98. 1924.—Notes on certain fungi found from Oct. 19 to 25, 1923 are given.—*G. R. Bisby*.

7224. ORTON, C. R. **Studies in the morphology of the Ascomycetes. I. The stroma and the compound fructification of the Dothideaceae and other groups.** *Mycologia* 16: 49-95. Pl. 7-9, 2 fig. 1924.—After a brief review of bases of classification of the Dothidiaceae, the author summarizes fully the uses of the term "stroma" by various workers, beginning with its first use by Persoon. A summary is then given of the usage of the term "sclerotium" from its origin with Tode down to the present time. This is followed by an explanation of such terms as xyloma, xylostroma, plectenchyma, prosenchyma etc., which have been used for stroma-like structures. Two species, *Phyllachora graminis* (Pers.) Fekl. on *Agropyron repens* (L.) Beauv. and *Catacauma flabellum* (Schw.) Theiss & Syd. on *Pteris aquilina* L., were studied histologically. *Phyllachora graminis* is considered by the author as restricted to members of the Tribe Hordeae. The ascospores are matured in the spring within the dead leaves of the host. The mycelium penetrates through the cell walls and becomes generally distributed through the infected tissues. Coils, evidently ascogenous, were found, but their development could not be followed. The ascocarp develops as a ball of hyphae usually near the epidermis and enlarges until it occupies most of the space between the upper and lower epidermis. Ascocarps are formed progressively from the center of infection. The so-called clypeus is formed by hyphal outgrowths from the upper and lower layers of the pyrenocarp. These hyphae penetrate the upper, then the lower, epidermal cells of the host and the continuous clypeus is formed by the fusion or intermingling of hyphae from the several pyrenocarps. A typical stroma is, therefore, not produced. Paraphyses and asci are meanwhile formed, and periphyses appear to resorb the overarching membrane of the perithecium to form the ostiole. The orientation of the pyrenocarp is variable. The young ascus is binucleate, then fusion, followed by 3 divisions, takes place.—*Catacauma flabellum* produces a stroma within the host. The so-called clypeus in this species is of different origin than in *Phyllachora graminis*, arising in part from early ramifying vegetative hyphae and in part from the stromatic elements. The ascocarps arise within the stroma after it is well formed. The asci develop in the usual manner from binucleated cells.—A discussion of the above named facts, and of the use of the term stroma, is given. *Phyllachora graminis* is considered as a much reduced type of the Sphaeriaceae in which the conidial stage is lost.—*G. R. Bisby*.

7225. ROWLEE, SILENCE. **A collection of Costa Rican fungi.** *Mycologia* 16: 115-121. 2 pl. 1924.—Notes are given on 30 species of fungi collected by W. W. Rowlee and H. E. Stork in Costa Rica during July and August, 1920.—*G. R. Bisby*.

7226. SEAVER, FRED J. **Cup-fungi of common occurrence.** *Torreyia* 24: 17-21. Pl. 2. 1 fig. 1924.—Characters are offered by which the following cup-fungi may be recognized: (1) Early spring species—*Sarcoscypha coccinea*, *Urnula Craterium*, *Sclerotinia tuberosa*, *S. Geranii*, *Morchella esculenta*. (2) Late spring and summer species—*Sarcoscypha floccosa*, *S. occidentalis*, *Acetabula sulcata*, *A. vulgaris*, *Helvella crispa*, *Gyromitra esculenta*, *Aleuria aurantia*, *Peziza repanda*. (3) Autumn species—*Peziza clypeata*. A photograph shows the puffing of spores in a cluster of *Sclerotinia*.—*J. C. Nelson*.

7227. SIDERIS, CHRISTOS P. Species of *Fusarium* isolated from onion roots. *Phytopathology* 14: 211-216. Pl. 9-11. 1924.—Of the 20 species of *Fusarium* isolated from onions with pink root, 13 were placed in previously described species and 7 were described as new. Observations as to the influence of substratum on morphological characters showed that protein substances induce development of aerial mycelium and prohibit production of sporodochial macroconidia. Dextrose produces the reverse condition.—Adeline Ames.

7228. SIEMASZKO, W. Fungi caucasici novi vel minus cogniti. II. Diagnoses specierum novarum ex Abchazia Adzariaque provenientium. [Caucasian fungi. II. Diagnoses of new species from Abchazia and Adzaria.] *Acta Soc. Bot. Poloniae* 1: 19-28. Fig. 5. 1923.—Continuing from his article in *Bull. Mus. Caucase* 12, 1919, the author describes the following as new: *Mycosphaerella Asclepiadis*, *M. Braheae*, *M. Crini*, *M. Hederaehelicis*, *M. Jasmini-officinalis*, *M. Moutan*, *Pleosphaerulina Houttuyniae*, *Physalospora Cocculi*, *Didymella Ulicis*, *Leptosphaeria Camelliae-japonicae*, *L. Chenopodii-albi*, *L. batumensis*, *L. Vrieseae*, *L. Moutan*, *L. Cerei-peruviani*, *Massaria batumensis*, *Phyllosticta Phyllostachydis*, *P. crinicola*, *P. Daphnes-ponticae*, *P. Houttuyniae*, *P. Nerii-oleandri*, *P. Nuttaliae*, *Phoma Lonicerae*, *Macrophoma Evonymi-japonicae*, *M. Nelumbii*, *M. theicola*, *M. Saponariae*, *M. Sterculiae*, *Aposphaeria Montbretiae*, *Coniothyrium batumenses*, *C. Choisiae*, *C. Alni*, *Camarosporium Phyllostachydis*, *Hendersonia Eriobotryae*, *H. Vrieseae*, *Stagonospora Ailanthi*, *S. Liriodendri*, *Septoria Dichrocephalae*, *S. Siegesbeckiae*, *S. Vrieseae*, *Colletotrichum Daphnes-ponticae*, *C. Eleagni*, *C. Passiflorae*, *Cryptosporium Camelliae*, *Cercospora Viciae*.—C. W. Dodge.

7229. STEVENS, F. L. New or noteworthy Porto Rican fungi. *Bot. Gaz.* 70: 399-402. 4 fig. 1920.—The genus *Trabutiella* n. gen., is described as differing from *Ditopella* by possession of a clypeus. The following new species are described: *Trabutiella cordiae*, *Linospora trichostigmae*, *Trabutia portoricensis*, *Hyponectria phaseoli*, and *Zythia phaseoli*. The characteristics of *Anthostomella rhizomorphae* (Ktz.) B. & V. are given.—P. A. Young.

7230. THAXTER, ROLAND. A revision of the Endogoneae. *Proc. Amer. Acad. Arts and Sci.* 57: 291-350. Pl. 1-4. 1922.—A general systematic treatment of this small group of fungi is given including descriptions of the following new species, with localities: *Endogone multiplex*, Maine; *E. incrassata*, Maine; *E. fasciculata*, Quebec; *E. vesiculifera*, Quebec; *E. tenebrosa*, Quebec; *E. radiata*, Maine and Quebec; *E. arenacea*, Trinidad; *E. canadensis*, Quebec; and *E. borealis*, Quebec.—John H. Schaffner.

7231. THAXTER, ROLAND. Note on two remarkable Ascomycetes. *Proc. Amer. Acad. Arts and Sci.* 57: 425-436. Pl. 1-2. 1922.—Descriptions are given of 1 new genus and 2 new species: *Hypocreopsis rhododendri*, on stems and branches of *Rhododendron maximum*. *Medeolaria* n. gen., and the type species, *M. farlowi*, on *Medeola virginiana*.—John H. Schaffner.

7232. TURLEY, HAROLD E. Mold, the bakers' enemy. *Baking Technology* 2: 144-145. 1 fig. 1923.—This is a popular discussion of the kinds of molds present in bakeries, their method of reproduction, the condition under which they develop most abundantly and suggestions for sanitary control.—Carleton R. Ball.

7233. WESTERDIJK, JOHA. Untersuchungen über *Nectria coccinea* Pers. und *Nectria galligena* Bresadola. [Investigations on *N. coccinea* and *N. galligena*.] *Rept. Internat. Conf. Phytopath. and Econ. Entomol. Holland* P. 171-173. H. Veenman & Sons: Wageningen, 1923.—The thickness of the perithecial wall is an uncertain character for separation of these species. Measurements of ascospores show that those of *N. galligena* from Pomaceae measure 17-18 μ in length while those from *Tilia* and *Populus*, considered characteristic of *N. coccinea*, measure 12-13 μ . Those of an intermediate form from *Fagus* measure 16 μ . Spores from culture media are smaller but the differences rarely exceed 1 μ as compared with material from the hosts. Spores of *N. coccinea* are somewhat more curved.—Harry Braun.

7234. WILSON, MALCOLM. *Puccinia mirabilissima* Peck, a new British record. *Trans. & Proc. Bot. Soc. Edinburgh* 28: 164-167. 1923.—This species of western North America is reported for the 1st time from Europe, where it was found on *Berberis* (*Mahonia*) *aquifolia* at Colinton near Edinburgh in October 1922, and later at Newlands, Peeblesshire. A full description of the spores and germination are given together with text figures.—L. R. Abrams.

7235. WILSON, O. T. Crown-gall of alfalfa. *Bot. Gaz.* 70: 51-68. Pl. 7-10. 1920.—Studies of material from the vicinity of Medford, Oregon, indicate that the crown-gall or

wart of alfalfa caused by *Urophlyctis alfalfae* (von Lagerheim) Magnus, passes through a plasmodial condition in some phases of its life-history. Cytological and cultural studies of the sporangia show that they divide to form motile zoospores, or possibly in some cases gametes. The prominent mycelium described by other writers as characteristic of the parasite was not found.—*Author*.

LICHENS

7236. DARBISHIRE, O. V. **British Antarctic ("Terra Nova") Expedition, 1910. Natural History Report. Botany. Part III. Lichens** P. 29-76. 2 pl. British Museum (Natural History) 1923.—This report is considerably more than its title would lead one to believe, as it not only gives a list of the 17 species of lichens brought back by the expedition, 8 of which are new to science, but gives also a complete record of all the lichens brought back by the various expeditions to the Antarctic, the total now being 208 species.—The new species, *Lecidea physciella*, *Buellia adarensis*, *B. evanescens*, *B. flavoplana*, *B. pycnogonoides*, *B. superba*, *B. tristes*, and *B. variabilis*, are described very fully, each description being accompanied by illustrations and many notes.—Following the descriptions of the new species a complete list is given of all the lichens thus far found in the Antarctic regions, arranged according to Reinke's classification. A "Key to the Genera known to have Representatives in the Antarctic" is followed by a "Key to the Species of any Genus known to have more than one Antarctic Species."—In an earlier report on the Antarctic lichens, (Darbish, Swed. Ant. 1912.) the author showed that 43% of the Antarctic lichens were known from the arctic regions; in the present report, he shows that "our views concerning the "Arctic" character of the Antarctic lichen flora, have been much modified." In other words, it appears now that there is a distinct antarctic flora, just as there is a distinct Arctic flora. Of the present number of Antarctic species, only 23% are Arctic.—As might be surmised, the number of crustaceous species predominate 73.6% being crustaceous, as compared with 13% fruticulose, and 13.4% foliaceous. The 3 genera best represented are *Buellia* with 46 species, *Lecanora* with 21 species, and *Lecidea* with 12 species.—*Charles C. Plitt*.

7237. MERRILL, G. K. **Some new species of American Cladoniae, with an enumeration and description of some hitherto unrecognized varieties and forms of the older species.** *Bryologist* 27: 21-26. 1924.—The article treats of 17 species. *Cladonia abbreviatula*, *C. leptothallina*, *C. microphylliza*, *C. exasperatula*, *C. heteromorpha*, and *C. piedmontensis*, the first 4 from Florida, the others from North Carolina, are proposed as new. The new forms *epiphylla*, *simplex*, and *brachiata* are proposed under *Cladonia Ravenelii* Tuck., and formae *squamulosa* and *stenophyllodes*, under *C. mitrula* Tuck., all from the Southern States. *Cladonia paludicola* (Tuck.) Merrill is a new combination, and there is a discussion of its variations. The remaining notes relate to records for various states—New England, Southern States, and Alaska. Merrill is the authority for all in each case.—*E. B. Chamberlain*.

7238. NILSSON, GUNNAR. *Arthonia spadicea* Leigh. funnen i Göteborg. [A. *spadicea* found at Gothenburg.] *Svensk Bot. Tidskr.* 17: 530. 1923.—This species was only once before found in Sweden, namely, in Scania.—*O. Heilborn*.

7239. PARLIN, JOHN C. **Maine lichens, 1922.** *Maine Nat.* 3: 61-63. 1923.

7240. SAMPAIO, GONÇALO. **Liquenes ineditos.** [New species of lichens.] 8p. Faculty of Sciences, Univ. of Oporto: Oporto, 14 Dec. 1920—Sampaio proposes as new and describes in detail with supplementary notes the following species, all from Portugal: *Buellia Duartei*, *Lepidium Newtoni*, *Lecania badiella*, *Lecidea Chodati*, *Acarospora varzinensis*, *A. Alberti*, *Lecanora Celestini*, *Lobaria mollissima*; Sampaio is the authority in each case. The article also notes the discovery in Portugal of *Rinodina isidioides* Oliv., previously considered endemic in the British Isles, and of *Buellia indissimilis* (Nyl.) and *Lecidea multipunctata* (Hepp), the last 2 being new combinations.—*E. B. Chamberlain*.

7241. VAINIO, EDWARD A. **Lichenes in Insula Trinidad à Professore R. Thaxter collecti.** [Lichens collected in the Island of Trinidad by R. Thaxter.] *Proc. Amer. Acad. Arts and Sci.* 58: 131-147. 1923.—Sixty-four species are listed of which the following are new species or varieties: *Heppia trinitatis*, *Bilimbia maravalensis*, *B. rufopunctata*, *Sporopodium thaxteri*, *S. glaucophaeopsis*, *Lecidea coronulans* var. *gaspareina*, *L. canoumbrina*, *L. cinereopallida*, *Pilocarpon glabrum*, *Gyalecta pachyspora*, *Tricharia amazonum*, *Thelotrema subulilacinum*

(Ellis) n. comb., *T. platycarpella*, *Graphis sangrensis*, *G. regressa*, *G. dilatascens*, *G. maravalensis*, *G. eszsolvens*, *G. collosporella*, *G. timida*, *G. anguilliformis* var. *infecunda*, *Arthonia candida* (Krempelh.), var. *hypocreoides* (Ferd. & Winge), *A. thamnocarpha*, *Thelenella thaxteri* Vain., var. *heterogena*, *T. elaeophthalma*, *Pseudopyrenula calospora* var. *rhodocheila*, *Pyrenula maravalensis*, *P. novemseptata*, *Stringula difformis* Vain., var. *arimensis*, *Porina granulifera*, *Arthropyrenia infernalis* var. *rhynchostoma*, and *Didymosphaeria megalospora*—John H. Schaffner.

7242. WATTAM, W. E. L. Sandsend lichen records, Yorks. Naturalist 1924: 137-140. 1924.—This is a list of 94 species seen in August 1923.—W. H. Burrell.

BACTERIA

7243. AZNAR, P. Bacilles aérobies à spores terminales de la flore intestinale de l'homme. [Aerobic bacilli with terminal spores in the intestinal flora of man.] Compt. Rend. Soc. Biol. 90: 674-675. 1924.—Descriptions and cultural characters are given for *B. reptans* and for a form which seems to be related to *B. pseudotetanicus* or *B. sphericus*.—Oran Raber.

7244. BEZANÇON, FERNAND, ANDRÉ PHILIBERT, ET PAUL HAUDUROY. Sur la structure des voiles jeunes des cultures de Bacilles tuberculeux. [Structure of the pellicle on young cultures of *B. tuberculosis*.] Compt. Rend. Soc. Biol. 90: 475-477. 1924.—The structure, staining properties, etc., of the surface pellicle which appears on cultures are given.—Oran Raber.

7245. DELAMARE, G. Divisions transversales et longitudinales chez *Spirochaeta vincenti* (variété bronchialis). Compt. Rend. Soc. Biol. 90: 611-612. 1924.—Transverse division is almost unique in this form. Both divisions are described in detail.—Oran Raber.

7246. GESSARD, C., ET A. VAUDREMER. Recherches sur la culture du Bacille tuberculeux. [Culture of *B. tuberculosis*.] Compt. Rend. Soc. Biol. 90: 732-734. 1924.—Various media are described which show that *B. tuberculosis* is very plastic and can grow and reproduce under diverse conditions.—Oran Raber.

7247. JORDAN, EDWIN O. Bacilli of the paratyphosus B group. Differentiation of the paratyphoid-enteritidis group. VII. Jour. Infect. Diseases 33: 567-575. 1923.—In all, 63 strains of the *B. paratyphosus* B group were examined. All but 5 fermented inositol, while 28 strains of *B. enteritidis*, 46 strains of *B. suispestifer*, and 24 strains of *B. paratyphosus* A gave no fermentation of this substance. Serologically, the group, *B. paratyphosus* B, is not homogeneous. Of the 63 strains, 33 belonged to a single agglutination group called the Schottmüller type, and 27 to another group called the Aertrycke type. The 3 other strains did not conform with either of these 2 groups. The strains of the 1st group were practically all obtained from typical paratyphoid fever in man. The strains of the 2nd group included those isolated from food poisoning outbreaks and those of rodent origin.—R. L. Starkey.

7248. REDDISH, GEORGE F., AND LEO F. RETTGER. A morphological, cultural, and biochemical study of representative spore-forming, anaerobic bacteria. Jour. Bact. 9: 13-57. 1924.—A thorough study of the following anaerobes was made: *Clostridium septicum*, *C. charwei*, *C. oedematiens*, *C. Welchii*, *C. tertium*, *C. aerofetidum*, *C. sporogenes*, *C. bifermentans*, *C. histolyticum*, *C. tetanoides*, *C. tetani*, and *C. putrificum*. A critical study of the criteria for classifying anaerobes was made and the following conclusions were reached: For consistent results, all morphological, cultural, and biochemical studies should be made under exactly the same conditions in the same kinds of media, and with cultures incubated for the same length of time, and at the same temperature. Liquefaction of gelatin should not be used as an index of proteolysis. Native proteins, such as serum-albumin and egg albumin, should be used in the tests for proteolysis. For classification purposes, the position and shape of the spore, colony form—particularly its surface, action on native protein, extent to which glucose is consumed, as well as the kind and number of substances fermented, peptolytic property, and pathogenicity are of most importance. Differences in liquefaction of gelatin, in the fermentation of particular test substances, and in motility are of relatively little value as criteria for classification.—C. E. Skinner.

7249. ROCHAIX, A. Milieux à l'esculine pour le diagnostic différentiel des bactéries du groupe strepto-entéro-pneumocoque. [An esculine medium for differentiation of bacteria of the strepto-entero-pneumococcus group.] Compt. Rend. Soc. Biol. 90: 771-772. 1924.

—*Enterococcus* grows and blackens this medium, *Streptococcus* grows but does not darken it, while *Pneumococcus* does not develop on it at all.—*Oran Raber*.

7250. TURLEY, HAROLD E. Bread crumbs and bacteria. *Baking Technology* 2: 76-79. 1923.—A survey was made of grocery stores in Chicago to learn the practice in receiving bread from bakers, displaying it for sale, and returning unsold loaves. Many receiving boxes were found with bottoms covered by a layer of old bread crumbs and dirt. In many stores the loaves were placed on counters exposed to dust and insects. A biological study was made of the air surrounding bread loaves in bread boxes, on the counters, and in display cases at grocery stores. Cultures were made also from dirt and bread crumbs from all places where bread was stored, especially where stale bread was placed when returned to the issuing bakery. Molds of many kinds developed abundantly from the different cultures. Putrefactive bacteria were also revealed in numbers. Numerous colonies of pus-forming bacteria (*Staphylococci*), several species of *Streptococci*, and some other infection-producing bacteria were found. The return of stale bread and its careless handling, as a source of infections in bakeries, is stressed.—*Carleton R. Ball*.

MYXOMYCETES

7251. SIEMASZKO, WINCENTY. Spis sluzowców z okolic Suchumu na Kaukazie. [List of *Myxomycetes* found in the vicinity of Soukhoun in the Caucasus.] *Acta Soc. Bot. Poloniae* 1: 90-92. 1923.

PALEOBOTANY AND EVOLUTIONARY HISTORY

EDWARD W. BERRY, *Editor*

(See also in this issue Entries 6909, 6973, 7120)

7252. ANONYMOUS. A forest buried under the city of Washington. *Gen. Sci. Quart.* 8: 594. 1924.—Excavations for a hotel have revealed, about 25 feet below the street level, great quantities of wood, tree-trunks and stumps. Some of the latter are 9 or 10 feet in diameter. Cypress is a common tree in this formation.—*L. A. Kenoyer*.

7253. BENSON, W. N. A review of recent researches on the Mesozoic floras of Australasia. [Review of nine recent papers on the Mesozoic floras of Australia and New Zealand.] *New Zealand Jour. Sci. and Tech.* 2: 29-32. 1919.

7254. BOWER, F. O. The present outlook on descent. *Nature* 113: 356-358. 1924.—The author emphasizes the importance of the study of morphology.—*O. A. Stevens*.

7255. BURRELL, W. H. Pennine peat. *Naturalist* 1924: 145-150. *Pl.* 10. 1924.—A microscopic study is made of upland peat and its subsoil and the conclusion is reached that within this area peat affords no evidence of extreme climatic change.—*W. H. Burrell*.

7256. CHEETHAM, CHRIS. A. Pennine peat. *Naturalist* 1924: 11-15. 1924.—After some remarks on the conditions which govern the upward growth of moor versus fen, the author states that peat has a very simple history in the Yorkshire Pennines. It is mainly formed by *Eriophorum vaginatum*, sphagnum peat being local and rare, and *Scirpus caespitosus* not much in evidence. A rainfall of at least 35 inches is necessary, but given a fairly constant supply of moisture, there is no limit to the upward growth of the peat. Within the area indicated, heather and similar plants growing on dry peat are not concerned with the building up of deep peat but are usually found where it is retrogressive. Birch layers often seen in sections of hill peat are considered to indicate either drier periods or an alteration of drainage leaving the surface in a drier condition.—Dealing with moor pan, the author does not accept the general opinion that peat was present first, and took part in forming the pan; the abrupt termination of roots at the pan layer shows that the pan was there before peat formation started. The question of pan formation is stated as very unsatisfactorily answered and further field and laboratory research are needed.—*W. H. Burrell*.

7257. КРЫШТОФОВИЧ, А. [KRYSHTOFOWICH, A.] Материалы к третичной флоре Дальнего Востока Азии. [Contributions to the Tertiary flora of eastern Asia]. *Records Geol. Comm. Russian Far East* 18: 1-14. 1921.—This paper consists of 2 parts. The 1st dis-

cusses the supposed contemporaneity of the Dui and Mgatch series of Russian Sakhalin and lists some of the fossil plants upon which this conclusion rests. These 2 stratigraphic series are considered to be of the same age (early Tertiary), possibly synchronous with the Kenai beds of Alaska, and constitute the lower coal bearing series of the island. The 2nd part lists 10 Tertiary fossil plants from Chang-gi in Korea.—*E. W. Berry.*

7258. SCOTT, D. H. *Extinct plants and problems of evolution.* xiv + 240 p. 63 illus. Macmillan & Co.: London, 1924.—This little book, founded on a course of public lectures delivered at the University College of Wales, Aberystwyth, in 1922, is, except for the majority of the illustrations, a largely nontechnical account of the major outlines of our knowledge of fossil plants.—Chapter I is a brief sketch of the present status of the various theories that have been advanced to explain the facts of evolution. The following 5 chapters are devoted to extinct floras, commencing with one tracing the Recent flora and its ancestors back to what the author calls the Cretaceous transformation, that is, the era of Angiosperms. Chapter III discusses Mesozoic floras and is devoted almost entirely to the Cycadophytes, and the author is inclined to regard as of phylogenetic significance the analogies between the bisporangiate fructifications of the latter and those of the angiosperms. Chapter IV is devoted to what the author calls the Permian transformation, and to a brief consideration of the seed ferns of the Paleozoic. Chapter V discusses the lycopods, horsetails and sphenophylls of the so-called Carboniferous flora which ranges in time from the middle Devonian to the Permian. Chapter VI is devoted to the early Devonian flora and is concerned almost entirely with the petrified plants recently discovered in the Rhynie chert, closing with a brief discussion of the bearing of paleobotanical evidence on evolutionary problems.—The author may be fairly said to favor the following propositions: (1) The origin of land plants from various specialized algal ancestors, somewhat after the manner set forth in Church's speculations. (2) A polyphyletic origin of the vascular plants, and a consideration of the Rhyniaceae as representing reduction products of some algal stock. (3) The independent origin of the seed ferns and the true ferns. (4) A community of origin between seed ferns and the Cordaitales, and the origin of the conifers and ginkgos from the latter. (5) A community of origin of the flowering plants and the Mesozoic cycadeoids. (6) That, on the whole, the evidence is favorable to the truly Darwinian conception of an orderly and gradual evolution. [See also following Entry].—*E. W. Berry.*

7259. SEWARD, A. C. *The history of the plant world.* [Rev. of: SCOTT, D. H. *Extinct plants and problems of evolutions.* xiv + 240 p. Macmillan and Co.: London, 1924 (See preceding Entry).] *Nature* 113: 596-597. 1924.—“A student who takes an impartial retrospect soon discovers that the fossil record raises more problems than it solves. . . . These . . . lectures, . . . if they do not furnish answers to leading questions, at least give us the best that is available and in a style which is singularly happy and stimulating.”—*O. A. Stevens.*

7260. S[HEPPARD], T. *Peat investigation.* *Naturalist* 1924: 55. 1924.—This is a report of a meeting held at Hull in connection with the British Association investigation of the Quaternary peats of the British Isles. The Humber area on the East and the Mersey area on the West were marked for present work.—*W. H. Burrell.*

7261. WHITE, D. *Some needed peat investigations.* *Jour. Amer. Peat Soc.* 17: 45-56. 1924.

PATHOLOGY

FREDERICK V. RAND, *Editor*

LILLIAN C. CASH AND HARRY BRAUN, *Associate Editors*

(See also in this issue Entries 6851, 6861, 6870, 6874, 6876, 6893, 6901, 6923, 6925, 6938, 6956, 6978, 6981, 6984, 7001, 7022, 7025, 7029, 7030, 7074, 7093, 7103, 7105, 7126, 7137, 7157, 7158, 7178, 7202, 7203, 7204, 7206, 7209, 7214, 7217, 7218, 7219, 7224, 7227, 7233, 7234, 7235, 7381, 7382, 7397, 7398, 7400, 7408, 7409, 7412, 7416, 7483, 7497, 7498)

DISEASES CAUSED BY FUNGI

7262. ANONYMOUS. Report of the proceedings and recommendations of the Ninth Annual Blister Rust Conference held in Boston, Massachusetts, February 18 and 19, 1924. 126 p. [Mimeographed, U. S. Dept. Agric.] 1924.—This report of the white pine blister rust conference includes the Secretary's report and some 18 papers on the various phases of the subject including those on (1) the cooperative control program, (2) plan of work and (3) scientific investigations. In group (3) are included: The red currant question, by HAVEN METCALF; and Blister rust in the Northwest by L. H. PENNINGTON.—*Frederick V. Rand.*

7263. ANDERSON, P. J. How to prevent onion smut. Massachusetts Agric. Coll. Exten. Leaflet 79. 1-2. 1 fig. 1924.—A solution of 1 gallon of formaldehyde in 50 gallons of water is recommended for control of the onion smut fungus, *Tubercinia Cepulae* (Frost) Liro (= *Urocystis Cepulae* Frost), in the Connecticut Valley. At time of planting the solution is applied to the seed from a tank attached to the seeder and so equipped as to insure a constant outflow (Phytopath. 13: 161-168. Fig. 1-3. 1923.), the exact amount of solution depending on the amount of moisture in the soil: 50-60 gallons per acre on dry soils, 60-70 gallons on medium moist soil, and 60-70 gallons on wet and heavy soil. Due to chemical injury to the seed, growers are recommended to use an extra pound of seed to the acre with formaldehyde.—*Will A. Whitney.*

7264. BARNUM, CLYDE C. The production of substances toxic to plants by *Penicillium expansum* Link. Phytopathology 14: 238-243. 2 fig. 1924.—*Penicillium expansum* was grown on Czapek's solution for 9 weeks. Cut stems of *Malva rotundifolia* were placed in the flasks of culture solution. The stems wilted within a few hours, while controls in tap water and in uninoculated media were still fresh. Another series in which young cauliflower plants and alfalfa cuttings were used, gave similar results. The toxic property of the solution was not destroyed by heating in an autoclave at 110°C.—*Adeline Ames.*

7265. BOTTOMLEY, A. M., AND K. A. CARLSON. Parasitic attack on *Eucalyptus globulus*: A note on *Stereum hirsutum* in plantations in the Transvaal. Union of South Africa Forest Dept. Bull. 3. 1-8. 2 pl. Pretoria, 1920.—In the control of this parasitic species the mere charring of the outside of the stumps is insufficient as the mycelium inside remains unaffected and soon develops further. The entire stump and root system must be consumed by fire. When infection has reached a stage at which this is impracticable, the only remedy is to replant an infected plantation of *E. globulus* with an immune species naturally adapted to local conditions. [See also Bot. Absts. 8, Entry 2107.]—*C. F. Korstian.*

7266. BRISCOE, JOHN M. The white pine blister rust (*Cronartium ribicola* Fischer). Maine Nat. 1: 75-78. 1921.—This account of the life history of the fungus contains also a list of all species of 5-needled pines.—*C. A. Weatherby.*

7267. BROOKS, CHARLES. Phoma fruit spot of apples. Amer. Fruit Grower, 44: 14, 28, 53. Fig. 1-3. 1924.—This apple disease is discussed from the standpoint of its terminology, history and distribution, varieties affected, appearance, development, and control. While not difficult to control, it is pointed out that, since the disease is so susceptible to weather conditions and so erratic in its occurrence, control measures are often neglected. It is further shown that sprays directed upward from the ground are most effective since the blossom half of the apple is especially susceptible to this disease.—*Arthur S. Rhoads.*

7268. BROWN, J. G. Bunt of wheat. Timely Hints for Farmers 143. 1-12. 5 fig. Arizona Agric. Exp. Sta., 1923.—The life history of *Tilletia tritici*, the common bunt-producing fungus in Arizona, is given. The value of copper carbonate dust in the treatment of seed wheat for control of bunt is emphasized.—*Author.*

7269. BROWN, J. G. Rot of date fruit. Bot. Gaz. 69: 521-529. 5 fig. 1920.—Several varieties of dates grown in Arizona and southern California, including the Deglet Noor, are subject to a fruit rot which may affect 90-95% of the crop in years favorable to the disease. The symptoms are small rusty brown spots which enlarge, coalesce, and form a light cream to grayish area with chocolate brown margin. Translucent spots are also present. Both kinds of spots appear on leaves and on stems of fruit clusters. The rot occurs in mummified fruits which may cling to the fruit clusters or fall to the ground. An *Alternaria*, 2 species of *Aspergillus* and a *Penicillium* were isolated from spots on the fruit, rachis, and leaves. The preliminary paper is to be followed by a report on laboratory and field studies.—*Author.*

7270. COONS, G. H. **Timeliness in apple scab control.** Amer. Fruit Grower 44²: 33, 44, 51, 58. *Fig. 1-3.* 1924.—The importance of apple scab is pointed out and orchardists are warned not to be beguiled into a false sense of security because this disease does not cause noteworthy losses in certain years. A description is given of the various phases of apple scab and of its life history, and these facts are considered in relation to control by spraying. By reason of the apple scab fungus maturing earlier in Michigan and nearby states than was ordinarily supposed, the author strongly advises a delayed dormant or a pre-pink spray, not to take the place of, but in addition to the regular pink spray, which should be followed by a 3rd application when the petals fall. This bunching of the early sprays in the 1st part of the season is regarded as exceedingly important in view of the enormous power of spread possessed by the scab fungus. The 1st spray application is designed to prevent primary infections and the 2nd and 3rd to prevent secondary and tertiary infections. This process of heading off and preventing early scab infections is regarded as the only way whereby spraying can prevent apple scab in seasons favorable to this disease.—*Arthur S. Rhoads.*

7271. CURTIS, K. M. **Ascospore ejection of the apple and pear black-spot fungi.** New Zealand Jour. Sci. and Tech. 5: 83-90. 1922.—In *Venturia inaequalis* and *V. pirina*, on apple and pear leaves respectively, ascospore ejection in 1921 began about September 14, reached its maximum on October 2 and ceased by December 12. A greater number of spores is ejected from pear leaves, and the ejection is more regular. Plowing under of leaves can be effective only if the leaves are permanently buried. It is wiser to destroy the leaves in autumn by fire.—*H. H. Allan.*

7272. DAVIS, W. H. **Infection produced by the spores of *Ustilago striaeformis* (Westd.) Niessl.** Phytopathology 14: 244. 1924.—Successful infection of timothy seedlings with *U. striaeformis* was secured.—*Adeline Ames.*

7273. DORAN, WILLIAM L., AND A. VINCENT OSMUN. **Combating apple scab.** Massachusetts Agric. Exp. Sta. Bull. 219. 1-17. 1924.—This bulletin covers the experiments carried out by the Massachusetts Experiment Station for 1923 together with a summary of 3 years' work on the control of apple scab [*Venturia inaequalis* (Cke.) Aderh.] by means of various dusts and sprays. The results warrant the conclusions: (1) that scab can be controlled by dust if the schedule is begun with the prepink application, and by spray if begun with either the prepink or pink application; (2) that liquid lime-sulphur (1-50), dry lime-sulphur (4-50), atomic sulphur, and sulphur dust, as well as copper dust and Bordeaux mixture (3-10-50), are about equally efficient, although the last 2 mixtures are not recommended for any applications after the pink treatment, due to burning of the foliage and fruit; and (3) that calcium caseinate spreaders used with the liquid sprays decrease the percentage of scabby fruit only very slightly, and do not lower the percentage of scabby fruit when added to the sulphur dust.—*Will A. Whitney.*

7274. DUTTON, W. C. **Cherry diseases and their control.** Amer. Fruit Grower 44²: 6, 13, 24. 3 *fig.* 1924.—A discussion is given of brown rot and leaf spot of the cherry in Michigan. The seriousness of the latter disease is said to depend almost entirely on the amount and distribution of rainfall, particularly during the early part of the growing season, and it is pointed out that since this disease does not develop to a dangerous extent every season it tends to cause many growers to become lax in their spraying operations. The effects of defoliation by leaf spot are also itemized. It is further pointed out that control of brown rot and leaf spot may be achieved readily by systematic spraying, supplemented by disposing of the old fruit and leaves which carry the disease over from one season to another. The relative merits of Bordeaux mixture and lime-sulphur solution for the control of these diseases are discussed, lime-sulphur being given the preference because it is not likely to cause foliage injury. A spray schedule is appended.—*Arthur S. Rhoads.*

7275. GARDNER, MAX W. **Apple blotch control.** Amer. Fruit Grower, 44²: 54-56, 58. 4 *fig.* 1924.—A discussion is given of the importance of apple blotch, varieties of apple susceptible, occurrence of blotch cankers on seedlings, origin of twig cankers, spread of the disease, importance of starting early the fight against blotch in the case of susceptible varieties in young orchards, directions for cutting out cankers and for spraying, and important supplementary measures in controlling this disease.—*Arthur S. Rhoads.*

7276. GUBA, E. F. *Phyllosticta* leaf spot, fruit blotch and canker of the apple; its etiology and control.—Phytopathology 14: 234-237. Pl. 12-13. 1924.—The author summarizes a paper to appear later. The disease is widely distributed over the eastern and southern U. S. A. probably having originated in shipments of trees from the apple district of the Ozark Mountains. The causal organism, *Phyllosticta solitaria* E. & E. probably belongs to the genus *Guignardia*. Minimum temperature for growth was found to be 5°-10°C., maximum 30°-35°C., optimum 25°-30°C. The organism survives a long exposure below 0°C. Pycnosclerotia were produced in culture. Enlargement of cankers and formation of pycnosclerotia with true pycnidia usually begins early in the spring. Cankers and pycnosclerotia appear on new growth in August. Natural infection occurs as early as April and as late as September. The cankers are probably the source of primary infection. Different varieties of apples show different types of fruit blotch. The canker lesions do not extend to the cambium; the fungus may thus be removed by cutting out the cankers. This, however, does not provide a practical method of control. Success lies in selection and planting disease-free trees, in selection of disease resistant varieties, excision of cankers and summer spraying with lime-sulphur at 2 and 3 weeks and with Bordeaux mixture at 4, 6 and 10 weeks after the fall of the blossoms.—*Adeline Ames*.

7277. HARTER, L. L., AND J. L. WEIMER. Decay of various vegetables and fruits by different species of *Rhizopus*. Phytopathology 12: 205-212. 1922.—To determine the relative susceptibility of various fruits and vegetables to decay by different species of *Rhizopus*, 27 such hosts were inoculated with each of 11 species of *Rhizopus*. In most cases the fungous spores and mycelium were pricked into wounds with a needle; but with such comparatively dry vegetables as potato, beet, and dasheen the spores were germinated in a nutrient solution and poured into a well cut in the host tissue. The inoculated vegetables and fruits together with non-inoculated checks were incubated under moist conditions at temperatures of 20°-22°, 30°, and 35°C., according to the temperature requirement of the fungus used in making the inoculation. All of the hosts were susceptible to decay by most of the species of *Rhizopus* used. *Rhizopus microsporus* and *R. chinensis* seemed to be non-parasitic and produced only a few weak infections. Although some of the species of the *Tritici* group seemed to be more actively parasitic than *R. nigricans*, the greater part of the *Rhizopus* decay of vegetables and fruits found in the local markets was due to the latter species.—*B. B. Higgins*.

7278. MIX, A. J. Biological and cultural studies of *Exoascus deformans*. Phytopathology 14: 217-233. 2 fig. 1924.—Isolations of *E. deformans* (Berk.) Fuckel, the peach leaf curl fungus, were made from ascus-bearing leaves. Cultures were tried on a variety of media with varying degrees of success. Colonies on agar were pink in color and yeast-like in appearance. Gelatin was not liquified and there was no alcoholic fermentation in sugar broths. Growth in all cultures was composed of budding conidia. Germination by germ tube instead of budding occasionally took place. Short mycelial threads were formed in a few cultures. Thick-walled resting spores appeared in old cultures. Temperature studies showed that the minimum for growth is below 10°C., the optimum 20°C. or lower, the maximum 26°-30°C. and the thermal death point 46°C. Cultures kept at 30°C. died within a few days. Conidia in dry condition were found viable after 140 days at 30°C. and after 315 days at lower temperatures. Range of tolerance for acids and alkalis was beyond the limits of the indicators used (pH 3.3-9.75). Unsuccessful attempts were made to isolate the organism from the surface of infected peach twigs and from soil under infected trees. Isolations attempted from the interior of diseased leaves and stems were only occasionally successful. Inoculations into twigs and swollen buds when performed under suitable weather conditions resulted in producing the disease. The organism maintained its virulence after 22 months on artificial media.—*Adeline Ames*.

7279. MOORE, ENID S. The physiology of *Fusarium coeruleum*. Ann. Bot. 38: 137-161. Pl. 7-8, 10 fig. 1924.—The maximum rate of growth of *F. coeruleum* was found to lie at or near 30°C., the minimum slightly below 5°C., and the optimum between 15° and 25°C.—probably nearer 20°C. than 15°C. The concentrations (absolute and relative) of the substances utilized by the fungus as sources of N and C profoundly affect the reaction developed in the medium, and hence influence the amount and type of growth. The concentration of phosphate has relatively little influence. The existence of both varietal and seasonal differences in suscepti-

bility of tubers has been confirmed. The difference appears to be due neither to varying sugar-content nor to differences in acidity of the expressed juice. Furthermore, it can not be attributed to any difference in the cell walls of susceptible and resistant tubers when acted upon by an extract of the fungus.—*Margaret Newton.*

7280. NACION, CIPRIANO C. Study of *Rhizoctonia* blight of beans. *Philippine Agric.* 12: 315-321. 1924.—*Rhizoctonia solani* Kühn appears to be the only species found upon *Phaseolus lunatus* Linn. in the Laguna region of the Philippines. Other plants attacked are *Arachis hypogaea* Linn., *Capsicum* spp., *Glycine max* (Linn.) Merr., *Ipomoea batatas* Poir., *Oryza sativa* Linn., *Phaseolus mungo* Linn., *Saccharum officinarum* Linn., *Solanum melongena* Linn., *Vigna sinensis* Linn., and *Zea mays* Linn.—*Sam F. Trelease.*

7281. RHOADS, ARTHUR S. Acetates of copper as non-staining sprays. *Amer. Fruit Grower* 43¹¹: 6, 21. 1923.—The difficulty of controlling such diseases of grapes as bitter-rot (*Melanconium fuligineum*), white rot (*Coniothyrium diplodiella*), and ripe-rot (*Glomerella cingulata*), which often attack grapes during the ripening period, is discussed and the need pointed out of substituting for the universally used Bordeaux mixture, a fungicide that will leave only a very inconspicuous or colorless residue on the fruit and yet not cause burning of the foliage. The value of the copper acetates as non-staining fungicides is pointed out and the properties of the basic acetate of copper, or verdigris, and of the neutral, or normal, copper acetate are discussed. Experiments conducted in Missouri during the summer of 1923 indicate that the use of these fungicides at the rate of 2 pounds to 50 gallons of water, with the addition of $\frac{1}{4}$ pound of gelatine to increase the adhesiveness and spreading capacity, will prove effective and satisfactory as a final application to control the various fungi attacking ripening grapes.—*Author.*

7282. SCHOENE, W. J. Fourteenth report of the state entomologist and plant pathologist. *Quart. Bull. Virginia State Crop Pest Commission* 5: 1-28. 1924.—In the cedar eradication work of 1922-23 for the control of the cedar rust disease of apples a total of 200,000 acres of farm land was cleared of cedars at an approximate cost of \$30,000. It is estimated that the increased value of the apple crop of 1923 due to cedar eradication amounted to as much as \$300,000.—*F. D. Fromme.*

7283. SHAPOVALOV, MICHAEL, AND J. W. LESLEY. The behavior of certain varieties of tomatoes towards *Fusarium*-wilt infection in California. *Phytopathology* 14: 188-197. *Pl.* 7-8. 1924.—Wilt of tomatoes (*Fusarium Lycopersici* Sacc.) causes serious injury in California, especially in the coastal section. Tests were made of varieties resistant to wilt in other states, and of selections made for resistance from California-grown varieties. Plants were grown on soil artificially infected with a virulent strain of *Fusarium Lycopersici* and also on naturally infected soil. Three test plots in widely separated parts of California were used. Most of the varieties resistant in other states were found resistant under California conditions. The varieties Norton, Norduke and Marvel were resistant in all tests made. Several California selections were also found to have a high degree of resistance.—*Adeline Ames.*

7284. SMALL, W. On the occurrence of a species of *Fusarium* in Uganda. *Kew Bull.* 1922: 269-291. 13 fig. 1922.—This *Fusarium* produces a wilt disease previously known to affect carnations, *Delphinium*, *Nigella*, and *Cosmos*. The new hosts include seedlings of cashew nut (*Anacardium occidentale* L.), silky oak (*Grevillea robusta* A. Cunn.), rose apple (*Eugenia jambos* L.), and loquat (*Eriobotrya japonica* Lindl.). On cashew nut the disease takes the form of a severe wilt which seems to be new and which is described in detail. The fungus has been found also on carnations and *Antirrhinum* associated with *Heterodera radicola* Greef. This *Fusarium* is provisionally called *F. udum* Butl.—The paper comprises a detailed study of the symptoms of the wilt disease of cashew nut, isolation of the *Fusarium* from cashew nut and its growth in pure culture, infection and control experiments and cross-inoculation tests with isolations from the above named hosts.—*T. J. Fitzpatrick.*

7285. TEHON, L. R. *Marasmius* on wheat. *Mycologia* 16: 132-133. 1924.—A species closely allied to *Marasmius scorodonius* Fr. was found apparently parasitic upon a culm of Red Wave wheat. Fruiting bodies grew out of the basal node.—*G. R. Bisby.*

DISEASES CAUSED BY BACTERIA

7286. BROWN, J. G. **Black-arm of cotton: a successful method of control.** Timely Hints for Farmers 142. 1-8. 4 fig. Arizona Agric. Exp. Sta., 1922.—Black-arm (angular leafspot) of cotton caused by *Bacterium malvacearum* EFS. is an important disease in Arizona. The author advocates the use of sulphuric acid in delinting the seed as a method of control.—*Author.*

7287. DAY, L. H. **Spring precautions against pear blight.** Amer. Fruit Grower 44⁵: 15. 1924.—Directions are given for conducting the spring campaign against pear blight. The methods outlined consist in searching for diseased blossom clusters on the fruit spurs in the lower parts of the scaffold branches and clipping out and disinfecting the spurs bearing diseased blossoms before the disease gets into the scaffold, removal of all second bloom if there is any indication that there is much blight in the orchard or in neighboring ones, and in going over the orchard at regular intervals of a week or 10 days throughout the spring and early summer and cutting out all infected twigs and branches to a lateral a foot or more below external evidences of the disease, and in scarifying all cankers on larger limbs. The latter consists in shaving off the outer green bark down to the fibrous layer all over the canker and for several inches beyond all evidences of the disease. It is recommended that all wounds and tools be thoroughly disinfected with a preparation made by dissolving 4 gm. of cyanide of mercury and 4 gm. of bichloride of mercury in 1 pint of water and adding to this 3 pints of commercial glycerine.—*Arthur S. Rhoads.*

7288. JOHNSON, JAMES, C. M. SLAGG, AND H. F. MURWIN. **Host plants of *Bacterium tabacum*.** Phytopathology 14: 175-180. Pl. 5-6. 1924.—Extensive experiments were made to test the susceptibility of a wide variety of hosts to *Bacterium tabacum* Wolf and Foster. Infection was secured on 88 species of plants representing a total of 24 families.—*Adeline Ames.*

7289. THOMAS, H. E. **Tobacco wildfire and tobacco seed treatment.** Phytopathology 14: 181-187. 1 fig. 1924.—Wildfire (*Bacterium tabacum* Wolf and Foster) was first recognized in New York State in 1922 but the disease is apparently not widely distributed. An experiment was made in which seedlings grown from treated seed were transplanted to a plot containing soil in which tobacco plants from a badly infected field had been buried. Late in the season 13 of the 50 plants in this plot developed wildfire while the control plot had no diseased plants. Germination tests of tobacco seed treated with HgCl_2 showed no decrease in germination of treated seed planted in soil or in thin sowings in petri dishes as compared with that of untreated seed. Similar trials of seed germinated in bulk showed no germination of treated seed while the germination of the untreated seed was irregular, especially in the interior of the mass. Germination experiments at different temperatures showed a very low percentage of germination at 33°C. but a high percentage at 26°C. Results indicated that temperature as well as aeration must be considered, especially in the method of bulk germination. Seed treated with CuSO_4 , $\text{K}_2\text{Cr}_2\text{O}_7$, H_2SO_4 , or KMnO_4 germinated about as well as untreated seed. Copper sulphate gave especially good results but did not appear to kill all the tobacco organisms. Seed dried in the laboratory or in sunlight after treatment with HgCl_2 germinated as well as seed not dried. Seed germinated before sowing did not show any ultimate advantage in seedling development in comparison with seed sown dry.—*Adeline Ames.*

INFECTIOUS CHLOROSIS (MOSAIC AND PEACH YELLOWS GROUPS, ETC.)

7290. JOHNSTON, J. R. **The mosaic disease of sugar cane in 1923: a discussion of the problems to date.** 35 p., 1 pl. Agric. Res. Dept., United Fruit Co.: no place of publ., 1923.—Most varieties of sugar cane are susceptible. The Uba cane is immune; Badilla and Java 36 are highly resistant. Vigor and environmental conditions not yet fully understood affect the resistance of some cane varieties. Resistance cannot be increased by any known artificial treatment, nor can the diseased cane be cured.—The mosaic is infectious and is transmitted by the corn aphid, for which no successful control experiments have been conducted.—The disease can be greatly restricted by roguing, and can be entirely eliminated if sufficient healthy "seed cane" is available. An extended bibliography is appended.—*Harry Braun.*

7291. ORTON, W. A. An early report on infectious chlorosis. [Note from: LAWRENCE, J. A. M., Rector of Yelvertoft in Northampton-shire and sometime fellow of Clare-Hall in Cambridge. "The clergy-man's recreation: showing the pleasure and profit of the art of gardening." London, 1715.] *Phytopathology* 14: 189-199. 1924.

7292. RANKIN, W. H. Raspberry mosaic and mosaic-free planting stock. *Proc. New York State Hort. Soc.* 68: 272-280. 1923.—The principal cause of low raspberry yields in New York is "yellows" or mosaic. The fruit from diseased plants is flavorless, the canes are dwarfed and a thin growth with sparse yellowish foliage results. Before the middle of June the leaves show large green blisters which arch upwards, with yellow areas between. Later the leaves near the tip of the sucker show a yellowish, speckled mottling. Leaves put out during very hot weather do not show mosaic symptoms.—The raspberry aphid is the principal vector. Pruning and cultivating may indirectly spread the disease, for the aphids leave the wilting uprooted plants for fresh plants. The rate of spread is slow owing to the wingless condition of the aphid. High percentages of the disease are due to carrying over the accumulated spread into new plantings. Plantings containing large amounts of mosaic, leaf curl and rosette should be destroyed, and nursery stock not selected from them. Roguing, and breeding of resistant varieties are among the promising lines of control.—*Harry Braun*.

NON-PARASITIC DISEASES

7293. BAKER, CLARENCE E. The prevention of storage scald. *Amer. Fruit Grower*, 44¹: 7, 21. 2 fig. 1924.—The economic importance and symptoms of apple scald are discussed and the difference is pointed out between the regular scald and the companion storage disease of Jonathan and Rome Beauty apples, known as soft scald. The relation of the ripening process to scald development, the evolution of the oiled wrapper, and recent developments in oiled wrapper protection are reviewed, and the results of investigations on apple scald at Purdue Agricultural Experiment Station are given. The latter indicate the value of prompt storage in a cool, well ventilated place but show that immediate storage, ventilation or low temperatures alone can not be depended upon to control apple scald. Although not conclusively demonstrated, the use of shredded oiled paper scattered through the package, supplemented by lining and package with oiled paper, is thought to be a likely method of scald prevention with barreled apples.—*Arthur S. Rhoads*.

7294. HEPNER, M. J. Frost and the fruit grower. *Amer. Fruit Grower* 44¹: 5, 42. 1924.—This is a brief discussion of how frost is formed, the manner in which it causes injury to fruit buds and the methods generally used in forecasting frost.—*Arthur S. Rhoads*.

7295. HIGGINS, B. B. Winter injury to pecans. *Amer. Fruit Grower* 44¹: 13. 1924.—A considerable amount of dying of pecan trees in Georgia during the summer of 1923 is attributed to winter injury. Brief notes are given on the symptoms, nature and treatment of winter injury in pecan trees.—*Arthur S. Rhoads*.

7296. RHOADS, ARTHUR S. Lightning injury to grapevines. *Amer. Fruit Grower* 44¹: 11. 1924.—A brief description is given of the nature and characteristics of lightning injury to grapevines. The use of metal posts for the trellis is believed to be of value in minimizing injury by grounding the discharge before it can travel any appreciable distance along the trellis wires.—*Author*.

7297. RHOADS, ARTHUR S. Sun-scald of grapes and its relation to summer pruning. *Amer. Fruit Grower* 44²: 20, 47. 1924.—Sun-scald of grapes, which caused considerable trouble in ripening fruit in the Ozark section of Missouri, is reported to occur on vines where the foliage is sparse. The clusters of grapes exposed to the direct action of sunlight quickly acquire a coppery hue or become "bronzed," and, in severe cases, may become badly scalded on the exposed side, after which the injured berries rot or shrivel up instead of ripening. Even in berries that merely become bronzed the ripening is retarded, the berries have more or less of an acid taste and never acquire their normal sweetness. Where a fairly heavy summer pruning was practiced the grapes fully exposed to the sunlight were retarded in ripening from a few days to almost 2 weeks. Any appreciable amount of summer pruning is to be discouraged since it is believed that under most conditions the grape clusters ordinarily need all the shade protection that normal growth will afford.—*Arthur S. Rhoads*.

7298. RHOADS, ARTHUR S. Winter injury to grapevines. Amer. Fruit Grower 43¹²: 7, 31. 1923.—A discussion is given of the nature and symptoms of winter injury in grapevines. The value of selecting hardy varieties as a means of obviating this trouble is pointed out and it is shown that such cultural practices as will tend to hasten maturity and hardening of the wood will tend to prevent winter injury during ordinary seasons and to reduce it to a minimum under very unfavorable conditions.—*Author*.

7299. SCHOONOVER, W. R. Frost protection for California citrus orchards. Amer. Fruit Grower 44³: 10, 12. 3 fig. 1924.—The author emphasizes the importance of frost protection and the 2 phases to orchard protection by heating, namely, preparedness before cold weather sets in, and a good organization for firing and refilling. The main requirements for a heater are given and 3 of the most important types manufactured are described. A discussion is given of the number of heaters, the fuel, thermometers and automatic alarms required. The need for growers to have knowledge of weather conditions during freezes is pointed out. A summary of the equipment and cost data for heating a 10-acre orchard are given.—*Arthur S. Rhoads*.

7300. WHITTLE, C. A. Breeding cold resistance into citrus. Amer. Fruit Grower 44¹: 24. 1924.—A brief review is given of the breeding work of the U. S. Department of Agriculture in Florida to increase the resistance of citrus trees to frost in the hope of extending citrus culture farther north than the now recognized safety zone. Descriptions are given of the citrangequat and limequat, which appear to be the most promising fruits resulting from this work.—*Arthur S. Rhoads*.

DISEASES OF UNKNOWN CAUSE

7301. SCHERTZ, F. M. A chemical and physiological study of mottling of leaves. Bot. Gaz. 71: 81-130. 6 fig. 1921.—The leaves of *Coleus Blumei* (var. Golden Bedder) are very prone to mottling or loss of chlorophyll. Mottling progresses from the lower leaves upward and takes place first at the edge of the leaf, progressing slowly toward the veins and to the base of the leaf. Usually the pair of leaves immediately above these mottles next, and so on as the plant grows. The chloroplasts lose their green color, become reduced in size, and carry on very little photosynthesis.—Under usual greenhouse cultural conditions, this plant contains P and N little in excess of its immediate needs. This was shown by cuttings grown in phosphate-free nutrient mixtures; failure to grow was noticeable, although the plant maintained a healthy green color. When the plants were transferred to nitrate-free mixtures, they failed to grow and also lost their natural green color.—Under usual cultural conditions these plants seemed to have within their tissue Mg, Ca, and Fe greatly in excess of their immediate needs. Cuttings grown in nutrient mixtures lacking any one of these elements grew and maintained their normal green quite as well as in the complete nutrient mixtures. A deficiency of Mg or Ca apparently has nothing to do with mottling. More Fe was found in all parts of the mottled than in the green leaf. A deficiency in P caused a larger percentage of the leaves to drop than did a deficiency in Fe, Mg, Ca, or NO₃. A deficiency in P caused more of the leaves to drop, while a surplus of P did not prevent them from falling if N was deficient. The effect of adding N to a plant or withholding it was shown in a very few days by the change in color of the leaves. Addition of a N compound (NaNO₃) to a plant potted in soil kept the leaves on and the plant green, while the addition of Fe, Mg, Ca, or PO₄ made very little change in the appearance of the plant. In order to maintain a healthy condition and a green color the plants seemed to require more NO₃ than other plants of which we have a record. The mottled leaves always had a lower percentage of nitrate N, protein N, ammonium salts, and albuminoid ammonia than did the green leaves; mottled leaves had nitrites and free ammonia present in them. The general appearance of the mottling was similar to that of citrus. Mottling of the leaves greatly lessened the carbohydrate output. The catalase activity of the leaves was very greatly reduced as the leaves mottled. The dry weight of the mottled leaves was less and the ash greater than that of healthy green leaves. The amount of chlorophyll (a and b) was about $\frac{1}{2}$ that of lilac leaves; the proportion of a-b was the same as in other plants (lilac). The carotin and xanthophyll content greatly increased as the leaves mottled. Bacteria were found within the cells of the mottled leaves, but it is not known whether they bear a causal relation to mottling or not.—*Author*.

GENERAL AND MISCELLANEOUS PATHOLOGICAL LITERATURE

7302. ANDERSON, O. G. Some notes on spray machinery. *Amer. Fruit Grower* 44²: 3, 12, 26, 43, 50, 53. 2 fig. 1924.—Some of the problems relating to the selection and operation of spray machinery by the fruit grower are discussed with special reference to spray machinery specifications, types of spray machinery, selection of a suitable outfit, relation of the spray gun to the size and efficiency of the outfit purchased, and the criteria for judging spray outfits based on such important parts as cylinders, plungers, valves, air chamber, and agitators.—*Arthur S. Rhoads*.

7303. COCKAYNE, L. Yellow-leaf disease in *Phormium tenax*. *New Zealand Jour. Sci. and Tech.* 3: 190-196. 1920.—Yellow-leaf is an infectious disease due to fungoid or bacterial attack, occurring in most *Phormium* areas in New Zealand. The disease has a summer maximum, and in autumn and winter there is much recovery. Observations suggest that non-susceptible strains are fairly common, and the breeding of these is the most promising line of control.—*H. H. Allan*.

7304. DUTTON, W. C. Dusting and spraying peaches. *Amer. Fruit Grower* 44⁶: 4, 25. 2 fig. 1924.—Directions are given for the general summer treatment of peaches by spraying and dusting. Special emphasis is placed on the menace to the fruit by brown rot, and a special late application of either sulphur dust or spray, to be applied, about a week or 10 days before harvest, is recommended. The author's experiments show that peaches receiving this late application will stand up in better condition after packing and shipping.—*Arthur S. Rhoads*.

7305. FALCONER, WM. Plant galls of the Huddersfield district. *Naturalist* 1924: 151-156. 1924.—Two hundred ninety-six separate forms have been noticed in the area, some being recorded for the 1st time as occurring in the north of England.—*W. H. Burrell*.

7306. FLOYD, W. L. Citrus insects and diseases in Florida. *Amer. Fruit Grower* 44²: 16, 35, 42-43. 4 fig. 1924.—A popular account is given of the more common entomogenous fungi growing upon larvae of the white fly and upon various scale insects, together with methods of keeping these beneficial fungi in cold storage, culturing, and spreading their spores in infested groves. Notes are also given on spraying with combination insecticides and fungicides where it does not prove advisable to trust entirely to these fungi to keep their host insects in subjection.—*Arthur S. Rhoads*.

7307. GRANGER, K., AND A. S. HORNE. A method of inoculating the apple. *Ann. Bot.* 38: 212-215. 6 fig. 1924.—The authors have developed a modification of the method used by S. G. Paine. A cylindrical plug is removed from the apple by a cork borer, and after inoculation this plug is replaced. Melted paraffin is then seared around the margin of the plug, the whole surface of the apple is lightly rubbed with cotton-wool moistened with absolute alcohol, and the apple is finally wrapped in sterile, grease-proof paper.—*Margaret Newton*.

7308. HASKELL, R. J. Report of the fifteenth annual meeting of the American Phytopathological Society. *Phytopathology* 14: 200-210. 1924.—Mention is made of the regular sessions of the society, joint sessions with other societies, election of officers, and of the miscellaneous business transacted. The reports of the editor-in-chief of Phytopathology, and of the treasurer and the advisory board of the society are given.—*Adeline Ames*.

7309. McDONALD, A. H. E. Price of copper carbonate for treating seed wheat. *Agric. Gaz. New South Wales* 35: 258. 1924.—American CuCO_3 quoted at 20 cents per pound contains but 17% Cu, while CuSO_4 sold locally in Australia contains 50-60% copper.—*L. R. Waldron*.

7310. RAMSAY, A. A., AND E. L. GRIFFITHS. The preparation of home-made tobacco wash. Nicotine content and percentage extraction. *Agric. Gaz. New South Wales* 35: 295-297. 1924.—The increase in price of American proprietary nicotine preparations has made it desirable to develop formulas for home-made wash prepared from locally purchased tobacco dust. [See *Bot. Absts.* 12, Entry 4426.] Tobacco dust was extracted with water by 7 methods, results of which are presented in detail. The solution produced by extracting 2 pounds of tobacco dust with 3 gallons of water plus 7 ounces of lime in the cold for 24 hours gave best results in regard to keeping quality and total amount of nicotine extracted. Evidently nicotine exists only partially in combination with organic acids.—*L. R. Waldron*.

7311. RHODES, ARTHUR S. **The non-setting and shelling of grapes.** Amer. Fruit Grower 44: 10, 24-25. 2 fig. 1924.—Distinctions are made between 2 forms of coulure of grapes, in one of which the flowers fail to set fruit or the fruit drops before developing appreciably, and in the other of which the berries fall or shell off after they are well developed. Evidence is presented to show that, contrary to the impression current in American pathological literature, the non-setting of grapes is of far greater importance as a factor of loss than the commonly mentioned shelling, and the causes commonly given for both non-setting and shelling of grapes are reviewed. Evidence is presented to show the important rôle played by cold, rainy weather at blooming time in causing non-setting of grapes, both from retarding fertilization and from attacks of the blossom clusters by black-rot, and to show that certain fungous diseases may cause a typical shelling of the berries. Control measures are given for both troubles.—*Author.*

7312. RITZEMA BOS, J. [Rev. of: **Report of the international conference of phytopathology and economic entomology, Holland 1923.** 290 p. H. Veenman & Son.: Wageningen, 1923.] Tijdschr. Plantenz. 30: 29-35. 1924.—The reviewer gives a short historical sketch of the development of international coöperation in plant pathology.—*D. Atanasoff.*

7313. SNAPP, OLIVER I., AND JOHN C. DUNEGAN. **Spraying the Georgia peach crop.** Amer. Fruit Grower 44: 4, 18, 20, 22. Fig. 1-5. 1924.—A discussion is given of the present spray schedule for peaches, which was materially revised after the disastrous destruction of the crop in 1920 by curculio, and which has given excellent results during the past 3 years. The revised schedule is based on recent life history studies of the curculio, which show that 2 annual generations of this insect frequently occur in Georgia. The spray schedule centers about control of curculio and of brown rot which usually follows curculio injury, and it is shown that whenever the curculio is satisfactorily controlled in Georgia there is little or no trouble from brown rot. Field observations and laboratory studies demonstrate that there is very little, if any, curculio activity during the stone hardening period of the peach, egg deposition ceasing when the pit of the fruit begins to harden and not starting again until the fruit enters the ripening and swelling stage. Application of lead arsenate during this period therefore are regarded as of little value in curculio control. Supplementary measures for the control of curculio, which Georgia peach growers often enforce in addition to the spraying program, consist in frequently picking up and destroying the dropped fruit, disking under the soil as far out as the spread of the branches during the pupation season, and burning over surrounding woodlands and waste places during the winter in order to destroy the hibernating adult beetles.—*Arthur S. Rhodes.*

7314. STEVENS, H. E. **The present status of spraying and dusting for the control of citrus diseases.** Proc. Florida State Hort. Soc. 1923: 144-148. 1923.—The principal diseases and methods of combating them are presented. The dusting method for control of citrus diseases is still in the experimental stage but has features that appeal to the citrus grower, such as the greater ease of handling as compared with liquid sprays. To secure the necessary fungicidal action, dust should be applied to wet foliage. The 2 types of dust recommended are Bordeaux powder, and lime dust made of hydrated lime and finely powdered copper sulfate. Promising results were obtained for mango anthracnose by applying copper-lime dust B-11 or 15-85.—*J. C. Th. Uphof.*

7315. WHETZEL, H. H. **National Southeastern University of Nanking, China.** Phytopathology 14: 244. 1924.—An appeal is made for reprints, bulletins, etc., dealing with plant pathology and entomology to replace those lost when the library of the College of Agriculture was burned. Contributions should be mailed to Prof. P. W. Tsou, Dean of the College of Agriculture.—*Adeline Ames.*

7316. WRIGHT, A. M. **Moulds on frozen meats.** New Zealand Jour. Sci. and Tech. 6: 208-211. 1923.—Molds associated with the condition known as "black-spot" were *Mucor mucedo*, *Rhizopus* sp., *Penicillium glaucum*, and *Cladosporium herbarum* (one case only). Prolonged cold storage is not of itself a predisposing character, but the temperature should not rise above 9°C.—*H. H. Allan.*

PHARMACEUTICAL BOTANY AND PHARMACOGNOSY

HEBER W. YOUNGKEN, *Editor*
E. N. GATHERCOAL, *Assistant Editor*

(See also in this issue Entries 6870, 6902, 6922, 6923, 7169, 7369, 7440)

7317. ANONYMONS. The world's camphor production. *Pharm. Jour.* 112: 234-235. 1924.—The cultivation of *Cinnamomum camphora* is being extended to many parts of the world, particularly to India, Ceylon, Brazil, Argentine, southern Europe, and parts of Africa, as well as to Florida and certain southwestern parts of the U. S. A. Another camphor tree, *Dryobalanops aromatica* is extensively grown in the Malayan Archipelago, particularly in northern Borneo, Java, and Sumatra. This Borneo camphor is not much used in the occident, but is very widely used in China where it maintains a higher price than the ordinary camphor of commerce. The great commercial source of camphor still lies in Formosa where in 1916 the production reached the peak with 10,485,000 pounds. In 1921, Chinese exports of camphor amounted to 2,204,000 pounds. In the U. S. A., distillation of camphor cannot be carried on profitably except when the price is high. However, the plantings are continually increasing and bid fair to be of great commercial importance. Plantings however, are being made in Japan at the rate of 4-5 million trees a year.—*E. N. Gathercoal.*

7318. DAVIDSON, JOHN. The cascara in British Columbia. *Dept. Interior Canada, Forestry Branch Circ.* 13. 1-11., 8 fig. 1922.—The author describes the growth habits of *Rhamnus Purshiana*, found in the coastal regions of southern British Columbia. Descriptions and illustrations are given of the buds, leaves, flowers and bark. Methods of collecting the bark to conserve the supply are given and the possibility of cultivating the tree on an economic scale is discussed.—*Geo D. Fuller.*

7319. DOTT, D. B. Assay of extract of nux vomica. *Pharm. Jour.* 112: 337. 1924.—When NaOH is employed in the place of Na_2CO_3 in the official method for assaying nux vomica, the yield of strychnine is appreciably higher, and as it is important that so powerful an alkaloid should not be underestimated, it seems certain that in the assay of all the nux vomica preparations, caustic soda should be used in preference to carbonate.—*E. N. Gathercoal.*

7320. DOTT, D. B. Opium powder: loss of morphine on keeping. *Pharm. Jour.* 112: 337. 1924.—The further study of opium powder to determine the loss, if any, of morphine, indicates that an opium assayed each month during the year has suffered no loss of morphine. It was also found that drying of opium at 100°C. made no difference in the comparative strength of the morphine content; further, that drying at a higher temperature tends to dissipate the odor of opium.—*E. N. Gathercoal.*

7321. GARDNER, R. Notes on the chemistry of the New Zealand flora. *New Zealand Jour. Sci. and Tech.* 6: 147-151. 1923.—The paper gives a brief summary of the present state of our knowledge on the subject. A list of the literature is appended.—*H. H. Allan.*

7322. GOODSON, J. A. The constituents of the flowering tops of *Artemisia Afra*, Jacq. *Biochem. Jour.* 16: 489-493. 1922.—In an attempt to find an additional source from which to obtain the drug, santonin, 4 species of *Artemisia* were carefully examined. From *A. afra*, the only one obtainable in quantity, cerylcerotate, tricontane, scopoletin, and quebrachitol were isolated, none of which are regarded by the investigator as related to santonin.—*A. R. Davis.*

7323. HIRST, H. M. Asburn (Scarborough) medicinal herb garden. Report for 1923. *Pharm. Jour.* 112: 296-297. 1924.—This report on more than 100 species of medicinal plants grown in an outdoor garden presents the interesting features of growth, cultivation, and collection of medicinal parts for each species. A few species have been killed by the very unfavorable season. A list of the additions to the garden during 1923 follows.—*E. N. Gathercoal.*

7324. KASSNER, HERBERT C. The histological and chemical examination of the seeds of *Ipomoea Hederacea*, Jacquin, and other species of *Ipomoea*. *Pharm. Jour.* 112: 115-158, 182-185, 207-210, 231-234, 261-264, 306-308, 328-331, 357-359. 16 fig. 1924.—Seeds of several species of *Ipomoea* are collected in India and marketed there and in London as kaladana.

Seeds of *Ipomoea hederacea* Jacq., *I. muricata* Jacq., *I. pes-tigridis* L., *I. coccinea* L., *I. pilosa* Sw., and *I. eriocarpa* R. Br. were examined. All these seed can be distinguished both by microscopical and macroscopical features, of which a complete account, accompanied by original drawings at definite magnifications, is given in this thesis. Briefly, the seed of *Ipomoea hederacea* may be distinguished macroscopically from other *Ipomoea* seed by their blackish color, the presence of a minute protuberance at the distal end, a longitudinal dorsal groove, the presence of colorless, almost microscopic, trichomes sparsely scattered over the epidermis and of dense, minute, dark brown hairs in the hilar depression. One hundred of them weigh 3-4 gm. The pharmacognostic description in the British Pharmacopoeia, 1914, is inadequate, and excludes only those *Ipomoea* seed which are much larger than 5 mm. in length, and are not "nearly black."—Germination of seed of the above species shows that they can be readily distinguished, if necessary, by the character of their cotyledons and first leaves.—Seed of *I. muricata* constitute the most frequent substitute for, or admixture with, the pharmacopoeial product. Its seed are distinguished macroscopically by their smooth and completely glabrous exterior including the hilar depression, their ruddy-brown to dark brown color, and by the fact that 100 of them weigh 14-18.5 gm. Khory and Katrak's statement that the seeds are "spiny" is an error.—Seeds of plants belonging to other families than the *Convolvulaceæ* are occasionally substituted for, or found in admixture with, those of *I. hederacea*, but the official seed are easily distinguished macroscopically from all of them by their characteristic shape resembling a "quarter" of an orange. The arrangement of the parts of the embryo is characteristic, as is also the distribution of the resin-cells and the food reserves.—Microscopically the best diagnostic feature of all the above-mentioned *Ipomoea* seed is the epidermis, and *I. hederacea* may be distinguished from all of the other seed by the characteristic shape of the wavy walls, the dimensions of the epidermal cells in surface section, and by the presence of characteristic sparsely scattered trichomes of a restricted size.—The epidermis with its trichomes, and the hypodermis are absent from the mature seed of *I. muricata*. The palisade layer is the outer-most protective layer of the mature seed of this species, is much wider in transverse section, and is composed of more rows of shorter cells than that of the pharmacopoeial seed. With the exception of the size of the cells, the remaining tissues of the seed are similar to those of the official species.—All of these seed contain a crude resin and a fixed oil as their principal constituents. The physical and chemical constants for the resins indicate that they are closely similar, as is also the case with the oils.—The seed of *I. muricata*, which are a frequent substitute for the pharmacopoeial seeds of *I. hederacea*, contain a crude resin whose constants are somewhat different from those of the other seeds. The seed of *I. muricata* yield a larger percentage of ether extract after petroleum spirit, but a much smaller quantity of crude resin subsequently extracted by alcohol, than do the seed of *I. hederacea*.—Since none of the non-official species of *Ipomoea* seed contain as high a percentage of medicinally active resin as the pharmacopoeial seed, they should not be permitted as substitutes and especially as the natural seed themselves are frequently administered in the powdered state.—The seed of *I. hederacea* contain a small percentage (about 2%) of a true resin free from glucosidal matter, and this has been isolated for the 1st time. The percentage of crude resin in these seed is, however, comparatively high, and is composed of a mixture of the true resin with a large quantity of glucosidal matter.—Neither the true resin nor the crude resin of seed of *I. hederacea*, are identical chemically with convolvulin, the ether-insoluble resin of jalap. The true resin and the crude resin of kaladana differ from the jalap and scammony resins in that they are insoluble in ether and give an immediate turbidity on acidification of a boiled alkaline solution.—True kaladana resin does not precipitate as readily or completely as certain other convolvulaceous resins when an alcoholic solution is added to water.—The glucoside-free, true resin of kaladana possesses a medicinal activity similar to jalap resin. The crude resin, however, does not form a wholly satisfactory substitute for jalap resin owing to the presence of much glucosidal matter, which necessitates a considerably larger dose; this diluent is also hygroscopic.—*E. N. Gathercoal.*

7325. MAYO, N. S. Sweet clover hay poisoning. Jour. Amer. Vet. Med. Assoc. 65: 229-230. 1924.—A bull and a heifer on an Illinois farm died with symptoms like those described by Schofield (see Bot. Absts. 13, Entry 4625) as caused by spoiled sweet clover hay.—*C. D. Marsh.*

7326. MELLOR, ERNEST M. The countries our drugs come from. X. Portuguese East Africa (Mozambique). Pharm. Jour. 112: 291-293. 1924.—Among the drugs mentioned are cowage (from *Mucuna pruriens*), castor bean (from *Ricinus communis*) cashew (from *Anacardium occidentale*), Calumba, *Strophanthus*, Aloe, *Capsicum*, *Erythrophloeum*, etc.—E. N. Gathercoal.

7327. POUCHER, W. A. Bay rum. Pharm. Jour. 112: 186. 1924.—The industry of producing bay oil as centered in the island of St. Thomas, is discussed. The statement is made that practically no true bay rum—formerly produced so extensively by the distillation of the bay leaves with Demerara rum of high strength—is now produced. Bay oil is obtained by distillation of the green leaves with sea water in copper stills of about 200 gallons capacity, in which 400 pounds of leaves are treated at one time. As the oil tends to separate into 2 factions, the lighter one floating on the distilled water and the other sinking in it, care must be taken that these factions are mixed in their proper proportions. Several varieties of *Pimenta acris* yield the bay leaves, but one variety known as lemoncilla (from *Pimenta acris* var. *citrifolia*) is objectionable because of its lemon-like odor and is not used.—E. N. Gathercoal.

7328. SAFFORD, WM. E. Daturas of the old world and new: an account of their narcotic properties and their use in oracular and initiatory ceremonies. Ann. Rept. Smithsonian Inst. 1920: 537-567. Pl. 1-13, fig. 1-13. 1922.—Metal nut or dhatura, long used as a narcotic in Asia, was described by Linnaeus as *Datura metel*, but the name was subsequently misapplied to an American plant (*D. innoxia* Mill.), while *D. fastuosa* L. (a form of true *D. metel* with tuberculate instead of prickly fruits), and *D. alba* Nees were substituted for true *D. metel* of Asia. The seed of *D. metel* are still widely used in India. Seed of the typical form have been secured for propagation at Arlington Farm, U. S. Dept. of Agriculture. *Nacazcul* or *toloatzin* (*D. innoxia* Mill.) *ololiuhqui* of the Aztecs (*D. meteloides* Dun.) both Mexican species, and *D. discolor* Bernh. are allied to *D. metel*, having nodding fruits. Jamestown weed (*D. stramonium* L.) differs in having erect fruits. Torna-loca of Mexico (*D. ceratocaula* Ortega) is an aquatic plant. A group of tree-daturas of South America, called *campanillas* or *floripondios* by Spanish Americans, have been segregated as *Brugmansia*, but are here included in *Datura*. To this group belong the angel's trumpet (*D. suaveolens* Humb. & Bonpl.), and *D. sanguinea* Ruiz & Pav., the source of the sacred narcotic of the Temple of the Sun [in Colombia]. All of these American species of *Datura* as well as *tecomaxochill* of the Aztecs, of a related genus (*Solandra hartwegii*), were used in medicine and in religious ceremonies by the Indians in prehistoric times. The plants contain certain mydriatic alkaloids, atropine, hyoscyamine, scopalamine, and the recently discovered solandrine or nor-hyoscyamine. The shortage of certain imported medicines during the war has resulted in the cultivation of some of the American species, especially *D. stramonium*, as sources of a substitute for atropine.—A. Chase.

7329. SMALL, JAMES. Report on "Atyek." Pharm. Jour. 112: 29. 1924.—This bark from the Cameroons resembles yohimbe bark and has been identified as the bark of *Pausinystalia brachythyrus*. Macroscopic as well as microscopic characters bear a strong resemblance to the characters of Yohimbe, though the following points of difference may be noted: Atyek bark has on the outer surface many longitudinal cracks with recurved edges, but no transverse cracks, while Yohimbe has many transverse as well as longitudinal cracks. Fractures of Atyek always splinter and the cork is in 2 layers, the inner of which is pale brown or yellow. The 2 barks can be distinguished by color tests as follows: A few particles of Yohimbe bark shaken with very dilute caustic soda (10 drops of a solution of s.g. 1.168 in 30 cc. of water) impart a wine-red color to the liquid. Treated in the same way, the bark known as "Atyek" imparts a reddish-brown color.—A few particles of genuine Yohimbe bark shaken with very dilute ammonium hydroxide (5 drops of 0.880 ammonia in 10 cc. of water) impart a brilliant red color to the liquid. Treated in the same way, Atyek bark imparts a distinctive brown color.—It is probable that Atyek bark contains only a very small percentage of alkaloid and that the alkaloid is neither yohimbine nor any of its associated alkaloids.—E. N. Gathercoal.

7330. SMALL, JAMES. Report on "Atyeng." Pharm. Jour. 112: 29-30. 1924.—Atyeng is the bark of a Cameroon plant belonging to the *Rubiaceæ*, possibly a species of *Canthium*. It is quite unlike any species of *Pausinystalia* or other bark of the Yohimbe type, and can be

readily distinguished by a number of macroscopic and microscopic characters as well as by the color test with sodium hydroxide. Apparently no alkaloid is present in the bark.—*E. N. Gathercoal*.

7331. VALETA, ANTONIO. *Botánica práctica (plantas medicinales) [Practical botany (medicinal plants.)]* 91 p. 1 col. pl. Tipografía "Progreso": Montevideo, 1918.

7332. WILSON, THOMAS. The common daffodil (*Narcissus pseudo-narcissus*) as a poison. *Pharm. Jour.* 112: 141-142. 1924.—A further case of poisoning from the consumption of daffodil bulb is reported.—A crystalline alkaloid was obtained by Ewins in 1910 from the bulbs of *N. pseudo-narcissus*, which in doses of 0.125 gm. given by mouth to a cat caused vomiting, salivation and purgation. A very similar alkaloid has been isolated from *Lycoris radiata* and from other *Amarylidaceæ*.—*E. N. Gathercoal*.

PHYSIOLOGY

B. M. DUGGAR, *Editor*

W. J. ROBBINS, *Assistant Editor*

(See also in this issue Entries 6860, 6925, 6941, 6945, 6952, 6957, 6958, 7100, 7146, 7147, 7168, 7169, 7181, 7216, 7246, 7247, 7248, 7264, 7278, 7279, 7301, 7321, 7322, 7324, 7420, 7497)

PROTOPLASM, MOTILITY

7333. REED, GUILFORD, AND D. J. MACLEOD. The motility of bacteria as affected by hydrogen ion concentration. *Jour. Bact.* 9: 119-122. 1924.—The percentage of motile cells of *Bacterium typhosum* and *Pseudomonas pyocyanea* in cultures of different pH values formed a curve which correlated with the growth curves of these organisms in relation to the pH of the media.—*C. E. Skinner*.

7334. SCARTE, G. W. Colloidal changes associated with protoplasmic contraction. *Quart. Jour. Exp. Physiol.* 14: 99-113. *Fig. 1-4*. 1924.—The relation of various stimuli to contraction in cells of *Spirogyra* is discussed and an attempt made to explain it on the basis of colloidal changes. Upon the action of certain stimuli the chloroplast undergoes a longitudinal, reversible contraction and behaves as an elastic gel. During contraction the viscosity is lowered. Increased stimulation produces a solation of the gel which causes the chloroplast to behave as a fluid body under the action of surface tension. In this type of contraction the margin of the chloroplast becomes smooth and the chloroplast becomes a cylindrical or spherical body. The agents which produce contraction may be temperature changes, electrical shocks, or the various chemicals which produce general contraction of animal cells. The power of cations to produce these effects is proportional to their precipitating effect on colloids and to their effect on the viscosity of protoplasm and emulsoids. The gel state of the chloroplast is anisotropic. This property is lost on solation, but is recovered on re-gelation. Extreme stimulation may cause coagulation. A theory of contraction is proposed which postulates the hydration and dehydration of anisotropic micellae. [See also following Entry].—*C. H. Arndt*.

7335. SCARTE, G. W. The action of cations on the contraction and viscosity of protoplasm in *Spirogyra*. *Quart. Jour. Exp. Physiol.* 14: 115-122. 1924.—The limiting concentrations at which mono-, di-, tri-, and tetra-valent ions cause contraction in *Spirogyra* were determined by placing filaments starved by leaching in distilled water into the salt solutions to be studied. The duration of the experiments was limited to 1 hour except when Ca was added to the solution. In general, the critical concentration is determined by the valency of the cation; i.e., the higher the valency, the less the concentration required. This is similar to their relative effect on the contraction and solation of a gel and the lowering of the viscosity of a sol, although the effective concentration required for contraction is much less. Numerous discrepancies appeared, due to the varying rate of penetration of the various ions into the cells. Rapid penetration (within an hour) tended to produce vital contraction. Slower penetration resulted in toxic effects. Other interfering reactions with the trivalent cations and the heavy metals were the adhesion of the protoplast to the cell wall and probably in certain cases a tendency to produce increased viscosity by reversing the electric charge. Zn, Ca, and UO_2 produced no contraction. [See also preceding entry].—*C. H. Arndt*.

DIFFUSION, PERMEABILITY, PHYSICO-CHEMICAL PHENOMENA

7336. BRADFORD, SAMUEL CLEMENT. On the theory of gels IV. *Biochem. Jour.* 17: 230-239. *Pl.* 3. 1923.—The author critically examines previously recorded "gel-theories" and on the basis of his own investigations offers certain modifying suggestions. He concludes that "the forces which hold gelatin and agar in solution are the same as those that operate between other solutes and solvents, and that the setting of jellies of the natural emulsoid type is merely a process of crystallization." The formation of crystals in gelation is held to be governed by solubility of the gel, temperature and such other conditions as might influence crystallization in any solution.—*A. R. Davis.*

7337. HATSCHKE, EMIL. Structures in elastic gels caused by the formation of semi-permeable membranes. *Biochem. Jour.* 16: 475-478. *Pl.* 4. 1922.—As a result of continuous and uncontrolled diffusion during the drying of gels (such as copper ferrocyanide in gelatin) which form semi-permeable membranes, periodic structures are formed. These take the form of successive membranes produced under strain.—*A. R. Davis.*

7338. LLOYD, DOROTHY J. Notes on some properties of dialyzed gelatin. *Biochem. Jour.* 16: 530-540. *Fig.* 1. 1922.—Gelatin purified by dialysis at the iso-electric point and subsequently purified by precipitation in strong alcohol showed the following properties: (1) Soluble with difficulty in distilled water. (2) NaCl in small amounts increases gelling power, above a normal NaCl solution, gelling power is decreased. (3) In the presence of HCl it becomes much more soluble, but gelling power is diminished. (4) NaOH increases solubility and decreases gelling at higher pH values. The author discusses the bearing of the above properties on the general theory of gelation.—*A. R. Davis.*

7339. MACDOUGAL, D. T. Auxographic measurement of swelling of biocolloids and of plants. *Bot. Gaz.* 70: 126-136. *2 fig.* 1920.—The methods used in the study of colloidal preparations, the hydration reactions of which might furnish a physical basis of interpretation of some features of growth, and some results of measurements of changes in volume by the auxograph are described. Details of the construction and operation of the auxograph designed by the author are given. The experiments take into consideration the fact that plant metabolism is predominantly carbohydrate and that the mucilages or pentosans are a major constituent of vegetable cells. The coefficients of swelling, indicative of the proportions of water which may be taken up, were determined for the separate constituents. The highest hydration capacity (nearly 2800%) was exhibited by a mixture of agar, *Opuntia* mucilage and albumin. Some features of differential swelling are described, which are of possible cytological interest.—*Author.*

7340. OGATA, DAIZO. On the change of the osmotic pressure of solutions of certain colloids under the influence of salt solutions. *Biochem. Jour.* 16: 449-454. 1922.—As a result of extended experiments, the depressing effect of such salts as CuSO_4 , CaCl_2 , and Na_2HPO_4 upon the osmotic pressure exerted by certain colloids is held to be due to the increased aggregation of colloidal particles.—*A. R. Davis.*

WATER RELATIONS

7341. JOHNSTON, EARL S. Moisture content of peach buds in relation to temperature evaluation. *Bull. Amer. Meteorol. Soc.* 3: 132. 1922. [See also *Bot. Absts.* 12, Entry 3566.]

7342. SHULL, CHARLES A. Temperature and rate of moisture intake in seeds. *Bot. Gaz.* 69: 361-390. *4 fig.* 1920.—A study was made of the quantitative influence of temperature on absorption of water by seed of *Xanthium pennsylvanicum*, and cotyledons of Tom Thumb yellow, green Canada field, and small Scotch yellow peas. The curves of water intake can be represented by an equation or series of equations of the form $y = a \log_{10} (bx + 1) + c$. From this equation the velocities of intake have been calculated, and the mean value of the coefficient of absorption has been obtained. For *Xanthium* seed the value of the coefficients are 1.55 and 1.83, and 1.6 for split peas of the small Scotch yellow variety. The velocity was found to be an inverse exponential function of the amount of water previously absorbed. The data are held to discredit the hydrone simplification theory of absorption put forward by Brown and Worley with reference to *Hordeum* seeds, in 1912, and to favor the idea that absorption is

mainly a physical process, modified by temperature behavior of the seed colloids. Semipermeability is thought not to be important in determining the rate of water absorption.—*Author.*

7343. STILES, WALTER. The suction pressure of the plant cell. A note on nomenclature. *Biochem. Jour.* 16: 727-728. 1922.—The author argues that since the net pressure sending water into a plant cell, i.e., osmotic pressure minus wall pressure, is a pressure rather than a "force" or a "power"; the term "suction force" (Saugkraft) proposed by Ursprung and Blum, and the term "water absorbing power" proposed by Thoday might well be replaced by the term "suction pressure".—*A. R. Davis.*

MINERAL NUTRIENTS AND SALT RELATIONS

7344. REED, H. S., AND A. R. C. HAAS. Some effects of certain calcium salts upon the growth and absorption of citrus seedlings. *Amer. Jour. Botany* 11: 15-18. 1924.—Seedlings of *Citrus aurantium* were grown in carbon-treated distilled water plus a single Ca salt. When this salt was $\text{Ca}(\text{NO}_3)_2$, total growth and absorption of Ca were much greater than when CaCl_2 was used instead. In the latter case, the values of the net amount of Ca and Cl absorbed by the seedlings were in the ratio of 3 to 1. The growth of plants in solutions of Ca salts of equivalent Ca concentration is evidently dependent upon the nature of the anion. Seedlings of *Citrus limonium* were grown in solutions containing all the essential ions, and it was found that in this case the nitrate, sulphate, chloride and carbonate of Ca were essentially equal in the production of root growth. Growth was reduced, however, by reducing the concentration of Ca.—*E. W. Sinnott.*

PHOTOSYNTHESIS

7345. ILJIN, W. S. Der Einfluss des Wassermangels auf die Kohlenstoffassimilation durch die Pflanzen. [Effect of lack of water on photosynthesis.] *Flora* 116: 360-378. 1923.—There is a wide daily range of water-content in leaves of plants of various types from the steppes and exposed slopes in the region of Jekaterinoslaw. In periods of drought the daily loss may be $\frac{1}{4}$ – $\frac{1}{2}$ the water content. Quantitative tests of the effect of wilting on photosynthesis show that in *Bidens tripartita* a water loss of 43-44% caused a reduction of 53-78% in photosynthesis; in *Phlomis pungens* a water loss of 34% caused a reduction of 13%, while a water loss of 53% caused a reduction of 65%. When the wilted leaves regained turgor the full activity was not at once resumed; in *Centaurea scabiosa* the photosynthetic activity showed a reduction of 29% 16 hours after recovery.—*A. G. Stokey.*

METABOLISM (GENERAL)

7346. ARTHUR, J. M. Organic acids and anthocyanin formation. *Bot. Gaz.* 72: 332-334. 1921.—This is a review of the investigations of Combes, Willstätter, Everest and other workers of the past decade on the occurrence and chemical nature of anthocyanin and more particularly on the relation of organic acids to its presence. Some criticisms of the methods employed, particularly of the practice of incinerating the material, are made. It is pointed out that the relation of the organic acids may be definitely altered by burning so that a basic ash may result.—*Geo. D. Fuller.*

7347. ATKINSON, ETHEL, AND EDITH O. HAZLETON. A qualitative tannin test. *Biochem. Jour.* 16: 516-517. 1922.—For demonstrating tannins in plant tissue, a simple test is given which involves the tanning of gold-beater's skin by the plant extract and then staining with FeCl_3 .—*A. R. Davis.*

7348. BROWN, ELMER B., AND TREAT B. JOHNSON. Studies on catalysis. The behavior of the amino group when cytosine and nitro-uracil are reduced in the presence of colloidal platinum. *Jour. Amer. Chem. Soc.* 46: 702-708. 1924.

7349. CARRÉ, MARJORIE HARRIOTTE. An investigation of the changes which occur in the pectic constituents of stored fruit. *Biochem. Jour.* 16: 704-712. 1922.—Employing a method for the quantitative determination of pectin previously described [Carré, M. H. and D. Haynes, *Biochem. Jour.* 15: 60. 1921], the author follows the changes in pectin content of different varieties of apples during ripening and storage. Pectin is found to increase gradually during ripening until a maximum is reached; with over-ripening the pectin content falls off.

Time of picking has no influence upon the changes noted. The application of a new method for the determination of protopectin seems to indicate a definite relationship between soluble and insoluble pectin constituents.—*A. R. Davis.*

7350. COWARD, KATHARINE HOPE. The association of vitamin A with the lipochromes of plant tissues. *Biochem. Jour.* 17: 145-156. *Fig. 1.* 1923.—The author tested out a large number of diverse plant species, including many of agricultural interest such as marigolds, swedes, cucumbers, cauliflower, carrots, turnips, etc., as well as several flowers, but particularly varieties of *Narcissus*, with special reference to a relation between lipochrome content and vitamin A. Various parts of the flowers—corolla, perianth, leaves, etc.—were used separately. In general it was found that some lipochrome (usually carotin) is always associated with vitamin A in plant tissue.—*A. R. Davis.*

7351. COWARD, KATHARINE HOPE. The formation of vitamin A in plant tissues. II. *Biochem. Jour.* 17: 134-144. *Pl. 1, fig. 1-3.* 1923.—Using the growth of rats as a criterion the author concludes that light, either natural or artificial, is necessary for the formation of vitamin A in plant tissues. Such formation was independent of the presence of chlorophyll, of ultra-violet rays, or of Casalts. Chloroform vapor inhibited the formation of this vitamin.—*A. R. Davis.*

7352. DIXON, H. H. Transport of organic substances in plants. Presidential address to Section K—Botany, of the British Association, 1922. *Notes Bot. School Trinity Coll. Dublin* 3: 207-215. 1923.—[See also *Bot. Absts.* 12, Entry 3486.]

7353. DIXON, H. H., AND N. G. BALL. On the channels of transport from the storage organs of the seedlings of *Lodoicea*, *Phoenix* and *Vicia*. *Notes Bot. School Trinity Coll. Dublin* 3: 234-245. 1923. [See also *Bot. Absts.* 13, Entry 1117.]

7354. FULMER, ELLIS I., W. W. DUECKER, and V. E. NELSON. The multiple nature of bios: *Jour. Amer. Chem. Soc.* 46: 723-726. 1924.—These investigators, along with others, consider bios a stimulant rather than a vitamin. Their results indicate that bios contains at least 2 growth stimulants.—*J. M. Brannon.*

7355. GRIFFIN, E. L. Absorption and retention of hydrocyanic acid by fumigated food products. *U. S. Dept. Agric. Bull.* 1149. 1-15. 1 pl. 1923.—As HCN gas is so extensively used for fumigation to destroy insects, rodents, and the causal organisms of yellow fever, bubonic plague, and other diseases, these experiments were performed to determine the effect upon food-stuffs commonly exposed. Succulent vegetables were often rendered unmarketable due to physical injury. In general, all products absorbed some gas. The rate at which absorbed gas was lost by food-stuffs was quite variable. Various factors were considered and accurate results obtained. Chemical observations alone are included.—*A. D. Oxley.*

7356. JAMIESON, GEORGE S., AND WALTER F. BAUGHMAN. The chemical composition of sesame oil. *Jour. Amer. Chem. Soc.* 46: 775-778. 1924.—Analysis of sesame oil gave the following percentages of glycerides: oleic 48.1, linolic 36.8, palmitic 7.7, stearic 4.6, arachidic 0.4, and lignoceric 0.04, with unsaponifiable matter 1.7%.—*J. M. Brannon.*

7357. JOHNSON, TREAT B., AND H. W. RHINEHART. The isomeric modifications of methyleneamino-acetonitrile and their biochemical significance. *Jour. Amer. Chem. Soc.* 46: 768-775. 1924.

7358. MASON, T. G. A note on the growth and the transport of organic substances in bitter Cassava (*Manihot utilisima*). *Notes Bot. School Trinity Coll. Dublin* 3: 216-223. 1923.—Work was undertaken to ascertain whether there is any evidence for the presence of a factor correlating the activity of cells of the apical meristem and growth of the tuberous roots. Weekly measurements of stem height were made over a period of 18 weeks, and also at the end of the 27th week. Half of the plants were ringed 15 weeks before the termination of the experiment. It was found that the rate of growth was not affected by ringing for a period of about 3 weeks; it then commenced to lag behind that of the unringed plants. The weight of the tuberous roots of ringed plants was approximately $\frac{1}{4}$ that of the unringed. The stem, on the other hand, was more than 1.2 times as heavy.—It is concluded that the activity of cells of the apical meristem is not controlled by the supply of organic substances available, but is, on the contrary, determined by autogenous changes within the growing point. No evidence was obtained of the presence of a factor correlating the activity of the apical meristem with growth of the tuberous roots. It is pointed out that the experimental results are in

accord with the view that the rate of growth of the stem is conditioned by the catalytic activity of the cells of the apical meristem.—*G. B. Rigg.*

7359. NEGER, F. W. *Neue Methoden und Ergebnisse der Mikrochemie der Pflanzen.* [New methods and results in plant microchemistry.] *Flora* 116: 323-330. 1 fig. 1923.—The presence of indigo in the leaf of *Phajus* or *Calanthe*, can be shown by holding the leaf over a micro-burner for a few seconds and then cooling. In 1-2 minutes a dark blue ring appears, which, on bleaching with alcohol becomes more distinct. A section of the blue zone, especially after the application of H_2SO_4 , shows a collection of minute blue crystals of indigo. The cystospheres found in the leaves of certain species of *Begonia* are fatty in composition and show myelin forms with KOH. The effect of varying the amounts of $AlK(SO_4)_2$ added to Knop's solution used in raising certain species of *Symplocos*, on the occurrence of Al bodies in the leaves is given.—*A. G. Stoekey.*

7360. RUSSELL-WELLS, BARBARA. On carrageen (*Chondrus crispus*) III. The constitution of the cell wall. *Biochem. Jour.* 16: 578-586. 1922.—This paper deals with a comparison of the hot and cold water extracts of *Chondrus crispus*, both as to organic and inorganic constituents. Pentose bodies were found in both cases, but more in cold than in hot extracts. Pectic bodies were absent. Mucic, oxalic and tartaric acids represented the chief oxidation products, more mucic but less oxalic acid being obtained from the cold than the hot extracts. "The cold extract contains calcium and ammonium ethereal sulphates and its ash contains besides SO_4 and Ca, Mg, Na, K and traces of Fe. The ash of the hot water extract also contains these radicles, but has less Na and K and more Ca than that of the cold extract." Cellulose is present after extraction.—*A. R. Davis.*

7361. SHERMAN, H. C., AND MARTHA M. KRAMER. Experiments on vitamin A. *Jour. Amer. Chem. Soc.* 46: 1055-1063. 1924.—The object was to study storage of vitamin A in the body. Three methods of extracting this vitamin from meat are described. The type of diet influences storage of this vitamin. Vitamin A is needed at all times but the older animal has had greater opportunity for storage. "Even when the diets devoid of vitamin A were strikingly different in their mineral content and their ability to support the mineral metabolism of the body, the vitamin deficiency of the experimental diet and the vitamin content of the preceding diet together determined the survival period."—*J. M. Brannon.*

7362. STEEL, THOS. Fruit of banana. *Proc. Linnean Soc. New South Wales* 47: 444-445. 1922.—An examination (November, 1885) of husked fruit which had ripened on the tree gave no dextrin, more fruit sugar and less cane sugar than was reported by H. Prinsen-Griggs (*Jour. Soc. Chem., Ind.* 16: 939. 1897) for a Java plantain, and by E. Lenscher (*Jour. Chem. Soc. [London]* 1902: 421. Abs. ii.) for ripe banana with husks removed (no locality given).—*Eloise Gerry.*

7363. STEEL, THOS. Milk of unripe cocoa-nuts. *Proc. Linnean Soc. New South Wales* 47: 445. 1922.—In 1885, in Fiji, the author examined several samples of "milk" from green cocoanuts—the "bu" or "niu" used for drinking. He compares his results with Van Slyde's (*Amer. Chem. Jour.* 13: 130. 1891), and points out certain discrepancies.—*Eloise Gerry.*

7364. TUTIN, FRANK. A note on the hydrolysis of pectin. *Biochem. Jour.* 17: 83. 1923.—This note covers a brief elaboration of the author's former suggestion [see *Bot. Absts.* 11, Entry 1925] that pectin is the dimethyl-iso-propenyl ester of pectic acid.—*A. R. Davis.*

7365. WITZEMANN, EDGAR J. The action of guanidine upon glucose in the presence and absence of oxygen. *Jour. Amer. Chem. Soc.* 46: 790-794. 1924.—Guanidine is an organic base comparable to NaOH and KOH in so far as the velocity of saponification of ethyl acetate is concerned. This organic base causes a polymerization of glucose accompanied by yellowing, more readily than KOH.—*J. M. Brannon.*

METABOLISM (NITROGEN RELATIONS)

7366. CHIBNALL, ALBERT CHARLES. Investigations on the nitrogenous metabolism of the higher plants. Part III. The effect of low-temperature drying on the distribution of nitrogen in the leaves of the runner bean. *Biochem. Jour.* 16: 599-607. 1922.—The author notes that discrepancies in the literature concerning the amount of asparagine in plant tissue may be due to the condition of the tissue at time of examination. Leaves of runner bean, for example,

show that during drying at low temperature proteolysis occurs, resulting in an increase of the simpler water-soluble constituents, chiefly NH_3 (as NH_4 salts or as asparagine) and monoamino acids. The first group may be increased from 1 to 6% of the total N, the amount of increase depending on the conditions of drying. Proteolytic enzymes as well as the amidase, asparaginase, were shown to be present. The leaf proteins, while they are diminished in amount, are not appreciably changed in character.—A. R. Davis.

7367. CHIBNALL, ALBERT CHARLES. Investigations on the nitrogenous metabolism of the higher plants. Part IV. Distribution of nitrogen in the dead leaves of the runner bean. *Biochem. Jour.* 16: 608-610. 1922.—A comparison made between the N distribution in living leaves and leaves from the same plants after having been killed by frost reveals very little change.—A. R. Davis.

7368. LEPESCHKIN, W. W. The heat coagulation of proteins. *Biochem. Jour.* 16: 678-701. 1922.—This study deals with a comparison of the reaction velocities of "denaturation" and "agglutination" as 2 distinct processes concerned in heat-coagulation of proteins. The former process involves a reaction between protein and hot water; the latter, the relation of electrolyte to temperature in coagulation. The following headings indicate the scope of the investigation: (1) Experimental methods; (2) temperature coefficient of denaturation; (3) the nature of denaturation, the influence of H- and OH-ions upon the denaturation rate; (4) influence of salt upon the denaturation-velocity of protein; (5) cause and temperature coefficient of the coagulation of denatured protein; (6) influence of acids and alkalies upon the coagulation of denatured protein; (7) influence of degree of dispersion of denatured albumin upon its coagulation-velocity; (8) influence of salts upon the coagulation of denatured protein. Intensive studies were made under each of these headings and comparative reaction-velocities are given. An interesting method for obtaining quantitative data is described.—A. R. Davis.

METABOLISM (ENZYMES, FERMENTATION)

7369. ANNETT, HAROLD EDWARD. The enzymes of the latex of the Indian poppy (*Papaver somniferum*). *Biochem. Jour.* 16: 765-769. 1922.—A qualitative survey is made of the enzymes in the latex of *Papaver somniferum*. Evidence was found of weak proteolytic activity; but amylase, invertase, maltase, emulsin, and urease could not be demonstrated. Powerful oxidases acting on guaiacum, pyrogallol, benzidine, and tyrosine in the absence of H_2O_2 were present.—A. R. Davis.

7370. AYERS, S. HENRY, AND WM. T. JOHNSON, JR. Studies on streptococci. VIII. A note on hydrogen-sulphid production by streptococci. *Jour. Bact.* 9: 115-117. 1924.—*Streptococcus pyogenes* produced H_2S from media containing $(\text{NH}_4)_2\text{SO}_4$, but *S. mastiditis*, *S. lactis*, *S. kefir*, and *S. bovis* did not. All 5 species produced H_2S from media containing $\text{Na}_2\text{S}_2\text{O}_3$ and dextrose, while all except *S. kefir* also produced it from $\text{Na}_2\text{S}_2\text{O}_3$ media without the dextrose.—C. E. Skinner.

7371. CASTELLANI, ALDO, AND FRANK E. TAYLOR. Identification of inulin by a mycological method. *Biochem. Jour.* 16: 655-658. 1922.—By making use of the differential carbohydrate fermentative power of *Monilia macedoniensis* Cast. and *Monilia tropicalis* Cast., the presence of inulin in tissues may be demonstrated. A table is appended listing combinations of fungi and bacteria by means of which various carbohydrates can be determined by fermentation.—A. R. Davis.

7372. HAHN, A., AND W. LINTZEL. Über das Verhalten von Pyrimidinderivaten in den Organismen. 1. Einfluss von Hefe auf Pyrimidinderivate. [Influence of yeast on pyrimidine derivatives.] *Zeitschr. Biol.* 79: 179-190. 1923.—The effect of yeast on the pyrimidine derivatives cytosine, uracil, and thymine, was determined by adding these substances to sugar solutions containing yeast. An extract of yeast was also prepared and the effect of its addition to solutions of these 3 materials determined. Living yeast cells and the extract decompose cytosine to uracil, evidently by an enzyme. Uracil and thymine were not acted upon by either the yeast cells or the extract.—C. H. Arndt.

7373. HEMMI, FUMIWO. The fermentation of glucose and fructose by dried yeast in the simultaneous presence of phosphate and sulphite. *Biochem. Jour.* 17: 327-333. 1923.—A comparison is made between the suggestion of Harden & Young that hexosediphosphate is

formed during alcoholic fermentation, and that of Neuberg, which holds that acetaldehyde is formed, and that when the latter is "fixed" by sulphite another compound is reduced, with the formation of glycerol. Neuberg believes that the formation of hexosediphosphate results from a pathological condition. The author's results show that phosphate in no way interferes with the formation of aldehyde. Moreover, the fermentation of potassium hexosephosphate yields aldehyde in the presence of sulphite.—*A. R. Davis.*

7374. KAY, HERBERT DAVENPORT. The reversibility of the action of urease of soy bean. *Biochem. Jour.* 17: 277-285. 1923.—The author shows that small quantities of urea may be formed when a strong solution of ammonium carbonate and carbamate is subjected to the action of urease.—*A. R. Davis.*

7375. NELSON, J. M., AND GROVER BLOOMFIELD. Some characteristics of invertase reaction. *Jour. Amer. Chem. Soc.* 46: 1025-1044. 1924.—The results of this work show that the sucrose concentration at which hydrolysis in the presence of invertase reaches a maximum velocity is independent of temperature and H-ion concentration, and the effect of these 2 factors upon the rate of the reaction is independent of the sucrose concentration. The hydrolysis of sucrose with invertase follows a normal course between the H-ion concentrations $10^{-2.75}$ – $10^{-3.3}$ in the acid region, to $10^{-8.4}$ in the alkaline region. The region of optimum activity of invertase at 25°, 30° and 35°C. is between the H-ion-concentrations $10^{-4.5}$ and $10^{-6.0}$.—"It was found that the temperature coefficient of the hydrolysis of sucrose in the presence of invertase was a function of the hydrogen-ion concentration and increased with decreasing acidity, and that hence the hydrolysis was inherently different from that by an acid where the temperature coefficient is independent of the hydrogen-ion concentration."—There seem to be 2 stages in the hydrolysis of sucrose in the presence of invertase. One is characterized by the sucrose concentration at which the hydrolysis attains a maximum velocity and is independent of temperature and H-ion concentration, while the other changes with each of the factors.—*J. M. Brannon.*

7376. NIERENSTEIN, M. Note on a new tannase from *Aspergillus luchuensis*, Inui. *Biochem. Jour.* 16: 514-515. 1922.—*Aspergillus luchuensis* grown on a medium containing gallotannin produces a tannase (gallotannase) which hydrolyses gallotannin but not catechutannin from *Paullinia cupana* H. B. and K. Grown on a medium containing catechutannin it produces a tannase (catechutannase) which hydrolyses chacheutannin but not gallotannin.—*N. J. Robbins.*

7377. ONSLOW, MURIEL WHELDAL. Oxidizing enzymes VI. A note on tyrosinase. *Biochem. Jour.* 17: 216-219. 1923.—The author reports observations supporting and extending Bach's view that tyrosinase is a mixture of enzymes. The author suggests that the enzyme complex is made up of a water splitting enzyme (deaminase or reductase), a carboxylase, and an oxidase—the latter, according to the author's previous investigations, consisting of oxygenase, an aromatic substance and peroxidase. All plants examined contained oxidase. This leads to the suggestion that tyrosine may go over into dihydroxyphenylalanine by the introduction of a second hydroxyl group; this, acting as a substrate for oxygenase, supplies "active" O_2 which, in turn, acts upon tyrosine in the following way: Tyrosine + "active" O_2 → dihydroxyphenylalanine + oxygenase → peroxide + other oxidation products. Peroxide + peroxidase → "active" O_2 .—*A. R. Davis.*

7378. ROBISON, ROBERT. A new phosphoric ester produced by the action of yeast juice on hexoses. *Biochem. Jour.* 16: 809-824. 1922.—This investigation is a continuation of the studies by Harden & Young on alcoholic fermentation. The author investigated the composition of an ester formed when fructose or glucose is fermented by yeast in the presence of soluble phosphate and found that it takes the form of hexosemonophosphoric acid. This is distinct from the hexosediphosphoric acid described by Young, Ivanov and Lebedev. The alkali salts of this compound are readily fermented by yeast juice and zymine. It is thought that it may be an intermediate stage in the formation of the diphosphoric ester. However, because of its specific rotation and behavior on hydrolysis, it is considered distinct from the hexosemonophosphoric acid which Neuberg prepared by partial hydrolysis of hexosediphosphoric acid.—*A. R. Davis.*

7379. SÖHNGEN, N. L., AND C. COOLHAAS. The fermentation of galactose by *Saccharomyces cerevisiae*. *Jour. Bact.* 9: 131-141. 1924.—Placing *Saccharomyces cerevisiae* in a

liquid nutrient medium containing galactose gives the newly formed cells the property of fermenting this sugar. This new property is due to the appearance of a new enzyme capable of fermenting galactose. The new enzyme, galactose-*zymase*, is more resistant than glucose-*zymase*, and under favorable conditions remains active after the stopping of growth. By applying a high temperature it is possible to obtain the galactose-*zymase* separated from the glucose-*zymase*. The disappearance of the newly formed enzyme, galactose-*zymase*, is approximately proportional to the quantity of fermented sugar containing no galactose. We may consider this phenomenon as *modification*.—*Authors' summary*.

7380. SPEAKMAN, H. B., AND J. F. PHILLIPS. A study of bacterial association. I. The biochemistry of the production of lactic acid. *Jour. Bact.* 9: 183-198. 1 pl. 1924.—In the commercial production of acetone and butyl alcohol by fermentation of cereals, lactic acid in large amounts is frequently produced by the associative action of *Bacillus granulobacter-pectinovorum* and *Bacterium volutans*. This is due to a partial inhibition of the normal physiological processes of the former species by some factor produced in cultures of *B. volutans*, which may be the product of the N metabolism of *B. volutans* growing in media of low carbohydrate content. When grown in media rich in carbohydrates this effect is not noticed.—C. E. Skinner.

7381. WILLAMAN, J. J. Pectin relations of *Sclerotinia cinerea*. *Bot. Gaz.* 70: 221-229. 1920.—When this fungus is grown on a fruit juice containing soluble pectin, it coagulates the pectin to a gel of calcium pectate by means of the enzyme pectase. When simple sugars are available, the fungus does not assimilate pectic substances; when they are not, the pectin is slowly utilized. The mycelium contains no pectin. When the fungus invades a tissue, it follows the line of the middle lamella by dissolving out the latter with the enzyme pectosinase. It probably reprecipitates the pectin of the lamella as calcium pectate. The latter, being a hydrophillic gel, maintains the firmness of the fruit even after rotting—a characteristic of fruit rotted by this fungus.—*Author*.

METABOLISM (RESPIRATION)

7382. ILJIN, W. S. Einfluss des Welkens auf die Atmung der Pflanzen. [Effect of wilting on respiration.] *Flora* 116: 379-403. 1923.—Results are given of experiments to determine the relation of respiration in the seed to its state of maturity, using varieties of *Triticum sativum*; and the relation of respiration in the leaf to variations in the water content, using plants from a variety of habitats, all growing in the region of Jekaterinoslaw (*Triticum sativum*, *Salsola kali*, *Rumex confertus*, *Bidens tripartitus*, *B. cernuus*, *Centaurea scabiosa*, *Statice Gmelini*, *Trifolium pratense*, *Ranunculus repens*). The great decrease in respiration as seeds ripen is not ascribed entirely to decrease in water content, but in part to other changes in the plasma. The behavior of leaves on losing water does not necessarily agree with that of seeds. Two types of plants were found: the first, usually xerophytes, showing a decrease; the second, in general plants from moist habitats, showing increase up to a maximum and then a decrease. In the case of *Ranunculus repens* the maximum respiration was 1.78 (1.0 being the normal) with a water loss of 41%. The variation from the normal is not so great in the 1st as in the 2nd group. In xerophytes it may be a case of reaching the maximum earlier. A comparison of healthy portions of leaves of *Helianthus annuus* with those affected by *Puccinia helianthi* showed photosynthesis in the ratio 22:8, and respiration, 24:36.—A. G. Stokey.

ORGANISM AS A WHOLE

7383. ATKINS, W. R. G. The hydrogen ion concentration of the soil in relation to the flower color of *Hydrangea hortensis* W., and the availability of iron. *Notes Bot. School Trinity Coll. Dublin* 3: 224-233. 1923.—The common garden hydrangea produces blue flowers when grown in soil at pH 5.7-6 or slightly over. In less acid habitats some flowers may be pink and others blue on the same plant, but above approximately pH 7.5, pink flowers only are the rule. The difference between the pink and the blue flowers is not due to differences in acidity in the tissues of the petals, since both colors from the same plant were found to have the same H-ion concentration, pH 4.2. Iron is more abundant in the blue flowers than in the red, and the

difference in color resulting from increased soil acidity seems to be due to the liberation of iron. It is suspected that Al as well as Fe forms a blue complex with anthocyan. With increased acidity, ferrous salts remain in solution after ferric salts have been precipitated or rendered completely insoluble as hydroxides. The precipitation of $\text{Fe}(\text{OH})_2$ does not begin until about pH 5.1 and even at pH 7.1 an appreciable amount remains unprecipitated.—*G. B. Rigg.*

7384. BROWN, J. G. Subcortical formation and abnormal development of stomata in etiolated shoots of *Opuntia Blakeana*. Bot. Gaz. 70: 295-307. Pl. 27-30, 1 fig. 1920.—This paper in experimental morphology describes changes which occurred in the shoots of prickly pear cactus (*Opuntia Blakeana*) when they were carried from the strong light of a southern Arizona slope into a dark chamber and then out again into the light. The most striking changes involved the behavior of the stomatal initials. Some stomata were developed under several layers of cortical cells and others were elevated on papillate structures. The etiolated shoots had 12-16 stomata per square mm. as compared with 32-36 in the epidermal layer of normal shoots. The stone-cork and palisade tissues so characteristic of normal shoots were lacking in the etiolated shoots, but palisade tissue developed when the etiolated shoots were transported to the light.—*Author.*

7385. FOLKARD, C. W. The bleeding of cut trees in spring. Nature 113: 492. 1924.—The question as to why, in certain cases, bleeding took place 44 hours after injury, is discussed. [See also this issue, Entries 7390, 7391.]—*O. A. Stevens.*

7386. FRY, E. JENNIE. A suggested explanation of the mechanical action of lithophytic lichens on rocks (shale). Ann. Bot. 38: 175-196. 6 fig. 1924.—It has been held that disintegration of the surface layers of rock on which lichens are growing is due to chemical alteration followed by separation of the parts of the decomposed material by the growing hyphae. However, mechanical disintegration of unaltered rock may take place 1st and be followed by decomposition of the separated fragments. The mechanical action is really due to the powerful forces exerted by the gelatinous substance of the thallus in contracting and expanding. Gelatin itself chips and corrodes a glass surface on which it dries, and repeated application and drying of fresh gelatin films will cause a complete perforation of a glass plate. In a similar manner superficial layers of shale are stripped off by drying gelatin.—*W. P. Thompson.*

7387. GUSTAFSON, FELIX G. Hydrogen-ion concentration gradient in plants. Amer. Jour. Botany 11: 1-6. 3 fig. 1924.—The H-ion concentration of the expressed juice from various leaves of the same plant and from various levels of the stem was determined by means of a potentiometer for corn, squash, pole bean, pumpkin and sunflower. The data show that there is a definite H-ion concentration gradient from one part of the plant to the other. This gradient is not in the same direction in different species nor in the leaves and stem of the same species. In corn, squash and pole bean the older leaves had a higher concentration than the younger leaves, while in pumpkin and sunflower the reverse was true. The bases of the stems of corn, sunflower and pumpkin had a lower concentration than the tops.—*E. W. Sinnott.*

7388. HARRIS, J. ARTHUR, ZONJA WALLEN LAWRENCE, W. F. HOFFMAN, JOHN V. LAWRENCE, AND A. T. VALENTINE. Tissue fluids of Egyptian and Upland cottons and their F_1 hybrid. Jour. Agric. Res. 27: 267-328. 1 pl., 1 fig. 1924.—The investigation covers a comparison of Pima Egyptian with Meade and Acala Upland cotton and a comparison of the F_1 hybrid, Pima \times Meade, with the 2 parent forms.—The Egyptian type, Pima, is characterized by higher osmotic concentration measured in terms of freezing point depression, Δ ; higher specific electrical conductivity, K ; H-ion concentration; and possibly by a higher ratio of conductivity to freezing point depression, K/Δ , than the Meade and Acala Upland varieties. The F_1 hybrid has a lower osmotic concentration and electrical conductivity than either of the parent forms but is intermediate with respect to the H-ion concentration of its leaf tissue fluids. All characters are clearly subject to a large environmental influence, and the method of dealing with these statistically is indicated. The possible practical bearing of the results is indicated.—*J. Arthur Harris.*

7389. LIESKE, RUDOLPH. Pflropversuche. IV. Untersuchungen über die Reizleitung der Mimosen. [Graft experiments. IV. Transfer of the stimulus in Mimosa.] Ber. Deutsch. Bot. Ges. 39: 348-350. 1921.—*Mimosa pudica*, *M. Spegazzinii*, *Neptuna oleracea*, *Mimosa argentea*, and *M. elliptica* furnished the material for these grafting experiments. The first 3 are notably sensitive and responsive plants. *Mimosa argentea*, on the other hand, responds

only under the most favorable conditions and strongest irritation, while *M. elliptica* is moderately irritable and responsive. Grafting was successful only at high midsummer temperatures. The best unions were between *M. elliptica* and *M. Spegazzinii*, but graft-symbiosis was established between *M. elliptica* and *M. pudica* also. In both instances it was possible to use either component as scion or as stock. Experiments on irritability could be carried out only when conditions were most favorable and after the union was completed. Since the reactions of the different symbionts were diverse in manner and in speed, even under the same conditions, the results of stimulation are the more striking. For example, if one stimulates a leaflet of the stock (*M. elliptica*) by burning, in full sunlight, at 38°C., and in high humidity, the adjacent leaflets rise and close together, and the stalks droop 10–20°. The speed at which the stimulus is transmitted is 2–3 cm. per second. When the stimulus passes through the point of grafting into the stalk of *M. Spegazzinii* it is transmitted 2–3 times as fast, the leafstalks drop more swiftly and to a greater angle, and the leaflets close much more speedily. If the stimulus is similarly applied to the graft, it is correspondingly transmitted downwards to the stock, which behaves as before. Thus it is proved that the same impulse is transmitted from species to species and that the reactions are characteristic of the species. However, the author advocates the extension of his very promising experiments under geographic and climatic conditions more favorable than those open to him.—*G. J. Peirce*.

7390. PARKIN, JOHN. The "bleeding" of cut trees in spring. *Nature* 113: 604–605. 1924.—This is a further comment on observations by the writer. [See also following entry, and Bot. Absts. 13, Entry 7385.]—*O. A. Stevens*.

7391. PRIESTLEY, J. H. The bleeding of cut trees in spring. *Nature* 113: 492. 1924.—Notes are given on experiments in progress, in which branches are cut each month. [See also preceding entry, and Bot. Absts. 13, Entry 7385.]—*O. A. Stevens*.

7392. STARIN, WILLIAM A. Pure cultures of *Cl. botulinum* from single cells. *Jour. Infect. Diseases* 34: 148–158. 1924.—Seven hundred fifty-two isolations were made of single cells and spores of *Clostridium botulinum*; of these, 227 grew. The time of exposure during isolation and growth of the organism with aerobes did not appreciably influence growth. The rate of growth and toxin production was more rapid at 37° than at 20°C.—*R. L. Starkey*.

7393. WAKSMAN, SELMAN A. Microorganisms concerned in the oxidation of sulfur in the soil. I. Introductory. *Jour. Bact* 7: 231–238. 1922.—The microorganisms concerned in the S cycle are separated into reducing and oxidizing bacteria, the latter being the true S bacteria. The true S bacteria are divided into 5 groups: the first 3 are found in S springs, curative muds, river water and sea water; they oxidize H₂S and sulphides, but not elementary S, and accumulate S within their cells. The 4th group consists of small rod shaped organisms found in sea water, canal water, and soil; these bacteria are able to oxidize H₂S and other sulphides, thiosulphates and elementary S, forming a heavy pellicle on the surface of the medium and allowing an accumulation of S outside of their cells. The 5th group occurs in soils to which elementary S has been added, particularly in soil-S composts, oxidizing primarily elementary S, thiosulphates to a small extent, but not H₂S or other sulphides. These bacteria grow uniformly throughout the media, not forming any pellicle, do not liberate any S, and allow a very intensive production of H₂S₄. The necessary C is derived entirely from the CO₂ of the atmosphere. This 5th group is morphologically related to group 4 but includes organisms very small in size and the strongest S-oxidizing and acid-producing bacteria known.—*Author*.

7394. WAKSMAN, SELMAN A. AND J. S. JOFFE. Microorganisms concerned in the oxidation of sulfur in the soil. II. *Thiobacillus thiooxidans*, a new sulfur oxidizing organism isolated from the soil. *Jour. Bact.* 7: 239–256. 1922.—*Thiobacillus thiooxidans* n. sp., an autotrophic organism, grows in inorganic liquid media, deriving its energy from the oxidation of S to H₂SO₄, its C from atmospheric CO₂, and its N from NH₄ salts. Sulphuric acid is produced to a strength of lower than pH 0.6, stronger than normal H₂SO₄, an acidity tolerated by no other known living organism. *T. thiooxidans* measures 1 × 0.5 μ, does not form spores, is strictly aerobic, and is non-motile or very slightly motile.—*C. E. Skinner*.

7395. WAKSMAN, SELMAN A. Microorganisms concerned in the oxidation of sulfur in the soil. IV. A solid medium for the isolation and cultivation of *Thiobacillus thiooxidans*. *Jour. Bact.* 7: 605–608. 1922.

7396. WAKSMAN, SELMAN A. Microorganisms concerned in the oxidation of sulfur in the soil. V. Bacteria oxidizing sulfur under acid and alkaline conditions. Jour. Bact. 7: 609-616. 1922.—*Thiobacillus thioparus* Beij. oxidizes S which is added to alkali soil until the reaction reaches about pH 4.5. If *T. thiooxidans* is present, the action is continued to about pH 1.0. *T. thioparus* functions only in alkaline, neutral, or slightly acid media, while *T. thiooxidans* grows only under acid conditions.—C. E. Skinner.

7397. WARREN, SHIELDS, AND STUART MUDD. The penetration of bacteria through capillary spaces. II. Migration through sand. Jour. Bact. 9: 143-149. 1924.—By allowing bacteria to migrate through sterile, moist sand, highly motile organisms may be separated from less motile or non motile species. *Erythrobacillus prodigeosus* (*Bacterium prodigeosum*) a very sluggishly motile species, was unable to penetrate 10 cm. of sand in 14 days. The maximum rate of migration for *Vibrio cholerae* was 0.55 cm. and for *V. percolans*, 0.43 cm. per hour. The last 2 species exhibit positive chemotaxis to nutrient media, and their migration is determined by available food supply.—C. E. Skinner.

GROWTH, DEVELOPMENT, REPRODUCTION

7398. BOYLE, C. Studies in the physiology of parasitism. X. The growth reactions of certain fungi to their staling products. Ann. Botany 38: 113-135. 5 fig. 1924.—When grown for a time on Richard's solution, potato extract, or apple extract, *Fusarium* sp. renders the medium unsuitable for further growth. On Richard's solution the fungus grows luxuriantly and stales the medium comparatively slowly. Potato extract is a less favorable medium for mycelial development but the staling process is extremely rapid. Apple extract, on the other hand, is a very unfavorable medium but the staling process is correspondingly slow. On all 3 media the fungus causes a decrease in H-ion concentration, and the growth-retarding effect can be partly removed by restoring the pH value of the staled medium to approximately that of the control. In the early stages of staling the inhibiting action of a staled medium on germination and growth can be partly removed by boiling. It has been shown also that these toxic substances are partly deactivated by precipitation with alcohol, and partly removed by filtration through a 90% collodian membrane.—Margaret Newton.

7399. GARNER, W. W., AND H. A. ALLARD. Effect of the relative length of day and night on flowering and fruiting of plants. Ann. Rept. Smithsonian Inst. 1920: 569-588. Pl. 1-17. 1922.—A series of experiments with several species of late flowering and fruiting plants in which the daily duration of light was shortened early in the summer by placing the plants in a dark house resulted in their much more rapid maturation. The length of day most favorable for flowering and fruiting varies greatly with different species. The maturation of some plants requiring relatively long days for flowering and fruiting, was prevented by artificially shortening the light period. This resulted in a continued vegetative development. A combination of growth with flowering and fruiting, resulting in everblooming and everbearing forms, occurs when the period of exposure to light is between the extremes most favorable for either one alone. Results of a similar type were brought about by artificially increasing the light period. In general the effect of varying the duration of daylight is apparently more influential in regulating growth and flowering and fruiting than are the more variable differences in intensity of light, temperature, and rainfall.—Neil Hotchkiss.

7400. LEONIAN, LEON H. A study of factors promoting pycnidium-formation in some Sphaeropsidales. Amer. Jour. Botany 11: 19-50. 1924.—The author studied pycnidium formation of 20 species grown in the same culture media. In the absence of light, 2 species failed to form pycnidia and in 12 reproduction was reduced. A temperature of 30°C. generally induced a better pycnidium production, even in darkness, than did 8°C., the latter temperature inhibiting reproduction in 9 species in the dark, but in none in the light. Decreased supply of O₂ suppressed fruiting in 3 species and reduced it in 11. Adsorption of the nutrient solution by filter paper was of no effect so long as moisture was abundant. When submerged, 8 species fruited well, 3 formed pycnidia but no spores and 9 formed no reproductive organs at all. Solid substrata were more favorable than liquid for the production of pycnidia. Generally a higher food-concentration produced more numerous pycnidia. A sudden complete withdrawal of food from a mycelium grown in a very rich solution was not, in most cases, conducive to better

reproduction; but if such a mycelium were transferred to a dilute nutrient solution, better reproduction followed. A sudden increase of food-concentration favored pycnidium formation. If the nutrient solution was dilute but renewed for 5 successive days, the effect usually approached that of a highly concentrated medium. Osmotic pressure was not a factor in growth and reproduction in these species. No evidence of auto-intoxication was seen in any of the cultures. A richly fed mycelium, if transferred to a dilute nutrient solution after an intervening period of starvation, produced a great abundance of fruit bodies. The mycelium may acquire certain tendencies not manifest unless environmental factors are changed.—*E. W. Sinnott.*

7401. SIMON, S. V. Über den Einfluss des Lichtes auf die Entwicklung der Keimlinge von *Bruguiera eriopetala*. [Influence of light on development of seedlings of *B. eriopetala*.] Ber. Deutsch. Bot. Ges. 39: 165-172. 1921.—The behavior of seedlings of the so-called viviparous mangrove plants has attracted so much more than ordinary attention that, in general, particulars only remain to be detailed. The author records his observations and experiments with the seedlings of this mangrove during his stay at the great botanical garden in Buitenzorg, Java. The material came from a tree about 5 m. tall, bearing from November to February many seedlings in various stages of development. Each night's heavy shower of rain knocked down some of these seedlings. About 20 of these, each 7-8 cm. long, were set in glass vessels $\frac{2}{3}$ filled with sand covered with water, $\frac{1}{2}$ in the dark-room, the other $\frac{1}{2}$ in a window with the direct rays of the sun excluded by a thin white screen. The temperature of the dark-room was 25-26°C.; that of the laboratory, 25-30°C. The humidity was about equal in the 2 places. The seedlings were thus cultivated for 4 months, at the end of which time it was evident that differences among seedlings in the light and in the shade out-of-doors are due to differences in illumination—shade and darkness delaying or preventing development of the plumule, stem, and branches, but at the same time having no effect on development of the root system. Simon compares this behavior with that of the more familiar plants of temperate regions—the only similarities being in the buds of copper beach and *Hydrocharis* and to a certain extent of *Utricularia*. Regeneration of amputated pieces is also largely controlled by light. On the basis of these observations he discusses theories regarding the influence of light, the theory of the light stimulus, and the theory of fatigue or inhibiting substances subject to photochemical influence, without, however, venturing to draw definitive conclusions from these limited data.—*G. J. Peirce.*

7402. UPHOF, J. C. TH. The physiological anatomy of *Mayaca fluviatilis*. Ann. Bot. 38: 389-393. 5 fig. 1924.—Investigations were directed to the behavior of the various organs and tissues when surrounded by air or by water. Plants derived from the same individual surrounded by air grew 25 mm. in 4 months; those surrounded by water, 90 mm. Leaves developed in the air are considerably shorter; the thickness of various tissues of the stem is also considerably less. Differences in tissues are given. It is noticeable that the thick-walled inner membrane of the endodermis is much thicker in the land form than in the water form; probably the pressure in the fibro vascular bundle requires in the former case a stronger developed inner endodermis wall.—*Author.*

7403. VYVYAN, M. C. Studies of the rate of growth of leaves by a photographic method. I. The determinants of the rate of growth of first leaves of *Phaseolus vulgaris*. Ann. Bot. 38: 59-103. 5 fig. 1924.—A photographic method is described for recording the daily increments in area of a leaf without detaching it from the plant; the sources of error in the method are discussed, and it is shown that they are not likely to amount to more than 1%. The dwarf kidney bean (*Phaseolus vulgaris*) was used throughout the experiment. When the apical bud and one 1st leaf were removed from each of a number of plants on the day the leaves expanded, the rate of growth of the remaining leaf was for over a week considerably faster than that of a single leaf on plants left intact. If in addition to the apical bud and one 1st leaf, the cotyledons were also cut off the rate of growth of the remaining leaf on the plants so treated was for 3 days considerably less than on plants with cotyledons; after the 3rd day the 2 rates of growth were about the same.—*Margaret Newton.*

MOVEMENTS OF GROWTH AND TURGOR CHANGES

7404. JUNGMAHN, W. Beobachtungen über die Entfaltung und die Bewegung der Lippe von *Masdevallia muscosa* Rchb. f. [Observations on the unfolding and movements of the lip in *M. muscosa*.] Ber. Deutsch. Bot. Ges. 39: 296-301. 1921.—A single blossom in a greenhouse in the Palm Garden of Frankfort-on-the-Main, late in November—the usual time to bloom being May to August—furnished the limited material from which the following observations were made. The movements of the lip as a whole require 1-1½ hours whether the movement is downward or upward in recovery following irritation of the lip by contact. When the flower has completely opened and the lip is expanded, the sensitive spot becomes exposed. When this spot is touched, the lip quickly rises, meets and overcomes the resistance of a projecting ridge, and closes promptly, the whole movement being a matter of seconds. However, closing of the lip may also be brought about by a sleep movement, due to fading light, or by even gentle transfer from damp to dry air. The actual movements are due to turgor changes in a part of the lip known as the joint or the strap. An insect, entrapped by the lip which it has touched and stimulated to close, can escape through a hole at the top of the flower only after collecting pollen.—*G. J. Peirce*.

7405. OEHLKERS, FRIEDRICH. Zur reizphysiologischen Analyse der postfloralen Krümmungen des Blütenstieles von *Tropaeolum majus*. [Analysis of postfloral bendings of the peduncles of *T. majus* due to irritability.] Ber. Deutsch. Bot. Ges. 39: 20-25. 6 fig. 1921.—This continues an investigation previously reported [see Bot. Absts. 9, Entry 1040] testing the epinasty of the flower-stalks of the garden nasturtium. The method consists in packing the flowers before their stigmas are receptive, placing the stalks erect in moist sphagnum in the dark for 24 hours, pollinating the flowers 8-10 hours after cutting and placing in the dark, and finally fixing the stalks on the horizontal axis of an intermittent clinostat making $\frac{1}{2}$ revolution in 12 minutes. Only such flower stalks were used as showed no evidence of torsion. The 1st experiment was conducted in darkness, at a temperature of 18°-20°C. Twelve stalks were used, of which 2 remained unfertilized. The remaining 10 showed a double dorsal-convex bending, the 2nd bend being the more pronounced of the 2; and the range of bending, 20°-90°. The 2nd experiment was lighted from the side by a 100-candle-power metal filament electric bulb at a distance of 50 cm. Again, 12 stalks were used, of which 1 remained unfertilized and 1 was completely bent by torsion (and discarded?). The remaining 10 showed a dorsal-convex bending amounting to 180°-360°. "Thus it is evident that epinasty as well as geotropism and phototropism are causes of postfloral bendings." The author shows this further by calling attention to the formation of complete loops on plants on the intermittent clinostat as well as in the open, especially in the light. To prove that epinasty is sufficient to cause postfloral bendings the author used young flowers. Fifty of these were put in moist sphagnum in the dark. Of these, 30 had just opened and none of the anthers were shedding pollen, and of the remaining 20, which were slightly older, the 1st anthers had begun to shed. The anthers of all were removed to avoid self-pollination. After about 3 days during which the stalks had become etiolated and lengthened considerably, the reactions began in the middle of the stalks, the middle part bending geotropically downward, the part immediately above, upward. The ventral-convex bend thus formed was gradually obliterated during the next few days, and finally the upper part of the stalk was directed downward. At this last stage the stigma had become receptive. A corresponding reaction followed when 30 young buds and stalks were similarly treated in the light, except that the combination of geotropism and phototropism with epinasty resulted in neutralizing the bends, the tendency to form which was considerably greater than in darkness. On the intermittent clinostat an even dorsal-convex bend forms within 48 hours. This can be strengthened or neutralized by epinasty according as the stalk of such a plant is laid horizontally with the one or the other face uppermost. The formation of complete bends and of loops is, therefore, a nastic reaction only when the tropistic reactions are prevented. The various reactions take place before fertilization is possible and, therefore, the postfloral bends are not directly related to it.—*G. J. Peirce*.

7406. SNOW, R. Further experiments on the conduction of tropic excitation. Ann. Bot. 38: 163-174. 6 fig. 1924.—When root-tips of *Vicia Faba* are cut off, stuck on again with gelatin, and then stimulated by a heated glass rod, the roots curve away from the stimulus,

showing that the traumatic excitation can pass through a layer of gelatin. By experiments involving the insertion of a slip of mica halfway through the root it was shown that excitation due to either traumatic or geotropic stimulus can be conducted along either side separately. With both kinds of stimuli the side which afterwards became concave was most efficient in conduction. When the tip of the cotyledon of *Avena* is removed and replaced in such a position that the side remote from the source of light is in contact with the side of the stump nearest the light and the tip alone is then illuminated, a curvature takes place away from the light. Therefore, the excitation transmitted from the far side of the tip simply causes relative expansion in that side of the lower region down which it passes. It is shown that the excitation can cross a gap filled with moisture. Evidence is given to show that Fitting's experiments do not prove that phototropic excitation in *Avena* can be conducted by a sinuous path and that it determines the direction of curvature by virtue of some polarity possessed by it.—*W. P. Thompson.*

GERMINATION, RENEWAL OF ACTIVITY

7407. BURKE, GEORGINA S. Studies on the thermal death time of spores of *Clostridium Botulinum*. 3. Dormancy or slow germination of spores under optimum growth conditions. Jour. Infect. Diseases 33: 274-284. 1923.—Spores of *Clostridium botulinum* may remain dormant for various periods after inoculation of media favorable for development. Most of the spores in both broth and agar media germinated within 15 days after inoculation but a dormancy period of 92 days in agar and 144 days in broth was observed. Heat injury may increase the duration of dormancy. The behavior of the dormant spores may be similar to that of seed of higher plants.—*R. L. Starkey.*

7408. COLEMAN, GEORGE E. Germination of spores of *B. botulinus* in collodion sacs in abdomen of guinea-pigs and rabbits. Jour. Infect. Diseases 33: 384-390. 1923.—Detoxified spores of *Bacillus botulinus* germinated readily in collodion sacs introduced into guinea-pigs and rabbits. Although potent toxin was readily formed in the sacs it did not dialyze through the membrane.—*R. L. Starkey.*

7409. PACK, DEAN A. After-ripening and germination of *Juniperus* seeds. Bot. Gaz. 71: 32-60. 1 fig. 1921.—No after-ripened juniper seed show very low germination. The seed have a semipermeable membrane and thick coat which permit rapid entrance of Ag and Hg salts, but slow entrance of acids. This coat serves as a protection against fungous attack and premature imbibition of water resulting in rupture of the seed. The food materials in the resting seed are in the form of fats and proteins with traces of glucose. The pH value of the endosperm is about 5 and of the embryo, about 8. Many physical and chemical forcing agents were used, but without apparent success. The dormant embryo of this seed seems to require after-ripening at 1-10°C. The changes that accompany after-ripening of the juniper seed at 5°C. were found to be as follows: (1) Rather rapid and complete imbibition, followed by a slow, steady decrease in water content during after-ripening or until near germination; (2) increased H-ion concentration, especially of the embryo; (3) an increment of titratable acid; (4) a steady and enormous increase in the degree of dispersion of the stored fat; (5) decrease in the amount of stored fat and protein, with an increase of sugar content and the first appearance of starch; (6) the translocation of food in the form of fat or fatty acids from endosperm to embryo; (7) a 7-fold increase in the amino acid content, and a complete disappearance of histidine from the endosperm; (8) an increase of soluble proteins with a marked hydrolysis of the stored proteins; (9) slight growth of embryo; (10) very slight increase of the respiration intensity; (11) increased respiratory quotient; (12) decreased intramolecular respiration; (13) a doubling of the catalase activity; and (14) rise in vigor of seeds as shown by their resistance to fungous attack. In conjunction with after-ripening at 5°C., desiccation seemed to give slight assistance. The end of the after-ripening period was fixed as the time when the hypocotyl broke through the nucellus membrane. Subsequent to after-ripening and germination at 5°C., the best temperature for seedling development is 15°C. The development of chlorophyll in the juniper seed may be inhibited by light, maximum temperature, or minimum temperature. Complete chemical analyses of the seedlings and of these seeds during after-ripening have been published in a later article.—*Author.*

7410. STILES, WALTER, AND MARGARET DELLOW. A note on the dormancy of the seeds of *Lathyrus maritimus*. Ann. Bot. 38: 209-212. 1924.—Dormancy is due to impermeability of the seed coat. Seed kept in distilled water for 12 months absorb no water whatever, as determined by weighing. If the coat is broken, water is absorbed rapidly (more than 200% of the original weight in a few days) and germination takes place at once. The impermeability is not due to any substance which can be removed by treatment with such solvents as ether, alcohol, etc. The cell walls give all the cellulose reactions.—W. P. Thompson.

RADIANT ENERGY RELATIONS

7411. JACOBSON, M. Die Wirkung der Röntgenstrahlen auf das Wachstum der Pflanzen. [Effect of Röntgen rays on the growth of plants.] Beilage zum Rigaschen Rundschau. 54⁴: 5. 1923.—After brief citations to previous work the author gives the results of his own experiments with various cereal grains and vegetables during 1920-22 in the agrophysical laboratory of the Agricultural University at Cory-Gorki. These experiments are said to demonstrate the possibility of a continuing stimulating effect of the proper dosage of Röntgen rays. For example, plants grown from corn grains (*Kornsamen*) exposed to the rays showed, after 2 months, a better development than control plants of the same age grown from seed not exposed to the rays. When a stronger dosage of the rays was employed the author observed the injurious effects previously reported by other investigators. When potato tubers were exposed to a properly limited (*genau definierter*) radiation applied during only 1 developmental stage (e.g., before sprouting), under natural conditions in the field (after planting?), effects both qualitative and quantitative were observed throughout the entire course of development of the plant to harvest time. By this treatment the crop of 1 variety was increased 84% in weight over the control plants; with another variety the increase was as much as 200%. Each tuber was larger than normal, and there was also an increase in the total number of tubers. When the potato tubers were exposed (before planting) to both Röntgen rays and the sun's rays, either at the same time or one after the other, growth was stimulated, but to a much less degree than when Röntgen rays alone were employed. Light rays also reduce the effect of Röntgen rays on the above-ground parts of plants, but not to so great an extent as with the subterranean parts.—C. S. Gager.

MISCELLANEOUS

7412. FELTON, LLOYD D. A description of a self-ventilating constant temperature incubator room. Jour. Bact. 9: 169-177. 2 fig. 1924.

SOIL SCIENCE

A. G. McCall, *Editor*

(See also in this issue Entries 6852, 6945, 6952, 7334, 7383, 7393, 7394, 7395, 7396)

7413. BURD, J. S., AND J. C. MARTIN. Some mutual effects on soil and plant induced by added solutes. California Agric. Exp. Sta. Tech. Paper 13. 1-27. Fig. 1-5. 1923.—This study was undertaken to obtain data on the "general effects of salt and fertilizer treatments on the water extractable constituents of soils; and . . . the effect of changes induced by salt and fertilizer treatments upon plant withdrawals and production." In preliminary experiments 2 soils treated with various solutions and salt mixtures, when examined after 8 months, showed increases in soluble constituents in genera. The changes are due to added solutes, to chemical replacements of solid phase material, to fixation by the solid phase, and to increased solubility of solid phase material in the new soil solution. Following these preliminary experiments, 2 soils on which a barley crop had been grown were given treatments of NaNO_3 , NaH_2PO_4 , and KCl . Only one treatment was made, but water extractions of both soils were made periodically for nearly 2 years. An increase of the added solutes was always observed in the early part of the season. In cases when no increase of crop was brought about, a correlation was observed between increases in soil constituents and the withdrawal

of such constituents by the plants. When an increase in yield was obtained, there was a correlation between the amount of some constituents (nitrate and phosphate in one soil, and nitrate in the other) withdrawn, and the yield of dry matter; but there is a lack of correlation between the withdrawal of constituents not of primary importance in growth, and the solubility of these same elements in the soil.—*Margaret Buwens.*

7414. O'GRADY, J. E. The lucerne lands of Tamworth and Mudgee. *Agric. Gaz. New South Wales* 35: 259-262. 1924.—Mudgee-grown alfalfa is of much better quality than that grown at Tamworth. The Tamworth soils are basaltic in origin, containing a fair proportion of sand, rich in lime and other plant food, friable and deep. The Mudgee soils are derived mainly from granitic rock, are friable and rich in lime, but are very much less fertile than the Tamworth soils. The better quality of Mudgee-grown alfalfa is evidently due to the lighter crop resulting from a soil comparatively deficient in fertility.—*L. R. Waldron.*

7415. KANE, IRVING P. The fertilizer value of activated sludge. *Proc. 1922 Conv. Amer. Soc. Municipal Improvements P. 113-27.* 1922.—It is shown that activated sludge containing 4.5% NH_4 could be used only in the low grade of complete commercial fertilizer. Sludge is handicapped on account of the tendency away from the manufacture of low grade fertilizer due to the high expense of transporting and handling large quantities of filler to obtain a small amount of plant food; and also because the freight charges in proportion to plant food content are 2.5 times as much as for high grade tankage. Various states require from 50 to 85% of the N in fertilizer be in an available form as determined by the alkaline permanganate test. A few tests on activated sludge have shown an availability of N of 35 to 50%. The following points are suggested for further study: (1) Nitrogen content of activated sludge; (2) variation of N content of sludge; (3) availability of N in the sludge by the alkaline permanganate and neutral permanganate methods; and (4) real value of the sludge to growing crops under conditions approximating those under which commercial fertilizers are used.—*U. C. Ruchhoft.*

TAXONOMY OF VASCULAR PLANTS

J. M. GREENMAN, *Editor*

E. B. PAYSON, *Assistant Editor*

(See also in this issue Entries 6918, 6921, 6939, 6951, 6962, 6965, 6966, 6967, 6969, 6970, 6972, 6983, 7013, 7137, 7206, 7328, 7331)

GENERAL

7416. ANONYMOUS. Congresso Luso-Espanico do Porto. Voto da subsecção de Ciências Biologicas (Sessão de 1 de Julho de 1921). [Iberian congress at Oporto. Vote of the subsection of biologic sciences. Session of July 1, 1921.] 4 p. Botanical Institute of the Scientific Faculty of [the University of] Oporto: Oporto, 1922.—The Congress of the 2 Peninsula Associations for the Advancement of Science voted to adopt the rules of botanical nomenclature approved at Vienna in 1905 with certain modifications, which in the main are: (1) unrestricted priority subsequent to 1753; (2) all family names shall end in -aceae; (3) generic names are invalid unless used binomially after 1753, if they express positive error, if they are generic names ending in -oides or beginning with *pseudo-*; (4) after 1753 the use of a generic name binomially, or a binomial combination, invalidates its use in a different category; (5) in generic changes the specific name adopted should be the oldest valid one not forming a homonym; (6) on the splitting of a group the original name must be retained for 1 of the new groups. In general the "modifications" seem closely to approximate the Brussels Rules of 1910.—*E. B. Chamberlain.*

7417. BATHER, F. A. Linnean nomenclature. *Nature* 112: 830. 1923.—This article concerns the treatment of varietal names, and contains an anonymous reply to Bather's remarks —*O. A. Stevens.*

7418. DUNN, S. T. *Botany of Bihar and Orissa*. [Rev. of: HAINES, H. H. *The botany of Bihar and Orissa*. An account of all the known indigenous plants of the province and of the most important or most commonly cultivated exotic ones. Gamopetalae Part IV. P. 419-754. Adlard & Son and West Newman: London, 1922 (see Bot. Absts. 12, Entry 2169).] Kew Bull. 1922: 304. 1922.—This is a short review which brings the account of the flora up to the end of the Labiatae.—T. J. Fitzpatrick.

7419. JUMELLE, HENRI. *Catalogue descriptif des collections botaniques du Musée Colonial de Marseille: Afrique Équatoriale Française*. [A descriptive catalogue of the botanical collections of the Colonial Museum of Marseille: French Equatorial Africa.] Ann. Mus. Colonial Marseille 31¹: 1-80. 1923.—The article lists, with descriptive notes, the plants from French Equatorial Africa that are of economic importance. The plants are classified in the following groups: (1) Feculent plants and cereals; (2) seeds and fruits; (3) caffeic plants and alcohols; (4) condiments and aromatics; (5) medicinal and toxic plants; (6) oils; (7) textiles and straws; (8) perfumes; (9) gums and resin; (10) caoutchouc and gutta-percha; (11) tannin and dyes; (12) woods; and (13) miscellaneous products.—L. M. Stupp.

7420. KOHZ, KURT. *Sero-diagnostische Untersuchungen über die Verwandtschaften innerhalb des Rosales-Astes der Dikotylen*. [Serum diagnoses on relationships within the Rosales branch of the Dicotyledons.] Bot. Archiv 3: 30-60. 1923.—The Rosaceae, Saxifragaceae, and Umbelliferae are regarded as forming the main stem of the offshoot of the Dicotyledons from which branch the other families of the Rosales. The Leguminosae and Platanaceae arise direct from the Rosaceae whose serum gives positive reactions with the sera of these 2 families.—William Seifriz.

7421. PAU, C. *El herbario de Planellas*. [Planellas's herbarium.] Brotéria Sér. Bot. 21: 43-48. 1924.—The article continues the discussion of plants contained in the Planellas herbarium. The present installment includes the Compositae—genera *Eupatorium* to *Arno-seris*. There are more extended critical notes upon *Phagnalon saxatile* (L.) Cass., and upon the derivation of the name *Carlina*. [See also Bot. Absts. 10, Entry 2006; 11, Entry 1599; 12, Entry 3583].—E. B. Chamberlain.

7422. SCHINZ, HANS, AND ROBERT KELLER. *Flora der Schweiz. I. Teil: Exkursionsflora*. [Flora of Switzerland.] 4th enlarged ed. xxxvi + 792 p. Hans Schinz und Albert Thellung: Zürich, 1923.—This standard manual of the flora of Switzerland which first appeared in 1900 is now much enlarged by the addition of new matter in both text and illustrations. Although a book of over 800 pages, it is still of a size and shape easily carried in the pocket and is, therefore, very convenient for field studies. There are complete keys to families, genera, and species with the usual data found in ordinary manuals. There are 701 genera and 2587 species listed; the Swiss flora is thus somewhat larger than the known flora of the state of Ohio which now numbers about 2200 species.—John H. Schaffner.

PTERIDOPHYTES

7423. HERTER, W. *Die Lycopodiaceen der Philippinen*. [The Lycopodiaceae of the Philippines.] Bot. Archiv 3: 10-29. 1923.—A collection of Philippine lycopods made by E. D. Merrill is described. Of 22 species identified the following species, varieties, and combinations are new: *Urostachys minimus*, *U. serratus* (*Lycopodium serratum* Thunb.) *U. verticillatus* (*L. verticillatum* L. f.) and its var. *giganteus*, *U. squarrosus* (*L. squarrosum* Forst.) vars. *intermedia* and *tenera*, *U. Magnusianus* (*L. Magnusianum* Hert.), *U. Whitfordi*, *U. Toppingi*, *U. carinatus* (*L. carinatum* Desv.), *U. Merrillii*, *U. pinifolius* (*L. pinifolium* Bl.), *U. Elmeri*, *U. banayanicus*, *U. phlegmaria* (*L. phlegmaria* L.), *U. salvinoides*, and *U. Delbrückii*.—William Seifriz.

7424. MARIE-VICTORIN, FR. *Les filicinées du Québec*. Suppl. Rév. Trimestrielle Canadienne 9: 1-98. 1923.—An introduction deals briefly with the physiography of the province of Quebec and with the geographic and ecological grouping of the species concerned. There follows a systematic enumeration of the 50 species of Polypodiaceae, Osmundaceae, and Ophioglossaceae known from Quebec, with keys, descriptions, and notes on nomenclature, morphology, folk-lore and medicinal uses. Two additional species, *Pellaea atropurpurea* (L.) Link and *Thelypteris simulata*, which have not yet been found in Quebec, are included

on the ground that they are likely to be discovered there. Two new combinations, *Cincinnalis latiuscula* (Desv.) Victorin and *Trichomanes platyneuron* (L.) Victorin, are made. There is a bibliography of 113 titles.—*C. A. Weatherby.*

7425. NYLANDER, OLAF O. Notes on Aroostook County ferns. *Maine Nat.* 4: 40-42. 1924.—Notes are given on 17 species, including *Aspidium Goldianum* Hook., rare so far north in Maine.—*C. A. Weatherby.*

7426. PITMAN, MRS. FRED H. Fern memoranda. *Maine Nat.* 4: 42-44. 1924.—Thirty species occurring in the vicinity of Winthrop are listed.—*C. A. Weatherby.*

7427. SCHINDLERÓWNA, H. Nowe stanowisko *Asplenium germanicum* Weis. [A new station for *A. germanicum* Weis.] *Acta Soc. Bot. Poloniae* 1: 60. 1923.

SPERMATOPHYTES

7428. ANONYMOUS. A catalogue of the orchid plants in the collection of Albert C. Burrage at Orchidvale, Beverly Farms, Massachusetts. *Small 8 vo*, 87 p. 1924.—This catalogue lists upwards of 100 genera and over 2000 species, varieties, and hybrids of orchids under cultivation.—*J. M. Greenman.*

7429. AMES, OAKES. An enumeration of the orchids of the United States and Canada. *8vo*, 120 p. The American Orchid Society: Boston, 1924.—This work presents for the first time a comprehensive survey of the native orchid flora of the United States and Canada. A key to the genera precedes the enumeration of species. Fairly full synonymy and bibliography are given; common names are added; and geographical distribution and the flowering season are indicated. The scientific names in practically all cases are in accord with the International Rules for Botanical Nomenclature.—*J. M. Greenman.*

7430. BALL, CARLETON R. Undescribed willows of the section *Cordatae*. *Bot. Gaz.* 71: 426-437. 1 fig. 1921.—Members of the section *Cordatae* are distributed from the Atlantic to the Pacific and from Arizona to Alaska. This paper describes 3 new varieties of *Salix lutea* Nutt., namely, (1) *famelica*, with very narrow and strongly-veined leaves, from Montana and the western part of the Dakotas; (2) *ligulifolia*, with dark brown branchlets and oblong leaves, a mountain plant occurring from the Black Hills and southern Wyoming to New Mexico and central California; and (3) *platyphylla*, with ovate-lanceolate leaves and long pedicels, from the Salt Lake and Snake River basins. *Salix monochroma* n. sp. has thin leaves, deep green on both sides, and is intermediate between *S. Mackenziana* and *S. pseudomyrsinites*, ranging from Yellowstone Park to Montana, Oregon, Alberta and British Columbia. *S. Farrae Walpolei* Coville & Ball is a new variety from Alaska, somewhat resembling *S. Mackenziana*, while *S. lasiolepis* var. *Bakeri* is a reduction of von Seemen's species, differing from *S. lasiolepis* only in the thinly pubescent capsules near the apex.—*Author.*

7431. BLAKELY, W. F. The Loranthaceae of Australia. Pt. III. *Proc. Linnean Soc. New South Wales* 47: 391-414. Pl. 32-47. 1922.—The genus *Loranthus*, leafy parasitic shrubs, is represented by 300 species (Engler); later additions probably more than double that number. The countries best represented are South Africa, Asia, the Pacific Islands, New Guinea, and Australia which has 41 species. The subgenus *Euloranthus* Benth. is discussed. A key is given to the species, together with descriptions and distributional notes. The following new forms are included: *Biflorati* n. subser., *L. gibberulus* Tate var. *Tatei* n. var., *L. ferruginiflorus* W. V. Fitz. var. *linearifolia* n. var., *L. Whitei* n. sp., and *L. Miquelii* Lehm. var. *minor* n. var.—*Eloise Gerry.*

7432. BURTT-DAVY, J. New or noteworthy South African plants. *Kew Bull.* 1922: 322-335. 1922.—Thirty species, including 16 species of *Acacia*, are fully annotated in this 5th installment. The following species and varieties are delimited and proposed as new: *Acacia ataxacantha* DC. var. *australis*, *A. Borleae*, *A. Galpinii*, *A. karroo* Hayne var. *transvaalensis* (Burt-Davy), *A. permixta* and var. *glabra*, *A. Rogersii*, *A. swazica*, *A. Woodii*, and *Cryptocarya transvaalensis*.—*T. J. Fitzpatrick.*

7433. CLUTE, WILLARD N. The Pentstemons. *Amer. Bot.* 30: 47-49. 1924.—A brief statement of the distinctive characters is given.—*Susan P. Nichols.*

7434. CRAIB, W. G. Contributions to the flora of Siam. Kew Bull. 1922: 225-241. 1922.—The following species are delimited, annotated, and proposed as new: *Michelia Rajaniana*, *Talauma Kerrii*, *Artabotrys Vanprukii*, *Polyalthia viridis* Craib (descr. ampl.), *Goniiothalamus calvicarpa*, *Mitrephora Winitii*, *Orophea siamensis*, *Stephania brevipes*, *S. erecta*, *S. Kerrii*, *S. oblata*, *Cyclea ciliata*, *C. varians*, *Capparis adunca*, *C. Kerrii*, *C. latifolia*, *C. nana*, *C. subhorrida*, *C. Winitii*, *Scolopia rhinantha* Clos var. *siamensis*, *Polygala Kerrii*, *Xanthophyllum obliquum* and var. *viride*, *X. siamense*, *Primula siamensis*, *Androsace similis*, *Lysimachia Smithiana*, *Symplocos Rajaniana*, *Rivea Clarkeana*, *Glossocarya siamensis*, and *Hymenopyramis cana*. *Indigofera oblonga* Craib described in Kew Bull. (1914) is amplified, and notes are given on *Mastixia euonymoides* Prain and *Paederia linearis* Hook. f. An additional note to the article concerning *Michelia Rajaniana* and *Symplocos Rajaniana* is given on page 255.—*T. J. Fitzpatrick.*

7435. DANGUY, P. Caprifoliacées. [Caprifoliaceae.] In: LECOMTE, H. Fl. Indo-Chine 3: 1-20. Fig. 1-2. 1922.—The author treats the genera *Sambucus*, *Viburnum*, and *Lonicera*. No new species, varieties, or combinations are included.—*Fanny Fern Smith.*

7436. EAMES, A. J., AND K. M. WIEGAND. Variations in *Trillium cernuum*. *Rhodora* 25: 189-191. 1923.—In *Trillium cernuum*, two well-marked tendencies have been found, one represented by eastern and the other by western plants; but the differences are not sufficient to be regarded as of a specific nature. Var. *macranthum*, the western form, stands between *Trillium cernuum* L. and *T. declinatum* (Gray) Gleason, but is apparently more closely related to the former to which it is referred as a new variety.—*Fanny Fern Smith.*

7437. EVRARD, F. Cornacées. [Cornaceae.] In: LECOMTE, H. Fl. Indo-Chine 2: 1182-1197. Fig. 142-144. August, 1923.—The author treats the genera from *Alangium* to *Nyssa*. No new species, varieties, or combinations are included.—*Fanny Fern Smith.*

7438. GUILLAUMIN, A. Les Chamaedorea cultives. [Cultivated palms of the genus *Chamaedorea*.] Jour. Soc. Nation. Hort. France 24: 223-244. 1923.—This paper gives a description of the genus and of each cultivated species, and a complete key for identification.—*H. C. Thompson.*

7439. HAUMAN, LUCIEN. Deux graminées géantes de la flore argentine. [Two giant grasses of the Argentine flora.] Physis (Rev. Soc. Arg. Ciens. Nat.) 5: 52-56. 2 fig. 1921.—The author describes 2 very large grasses from Argentina. The one, *Sporobolus maximus* Hauman n.sp., grows in tufts 3 meters high and half as broad, while the other, *Gynerium sagittatum* (Aubl.) Beauv., has a leafy stem, similar in habit to a yucca, 3 meters high surmounted by a flowering stem that attains a length of 2 meters. Notes on distribution and habit are included.—*Geo. D. Fuller.*

7440. HILL, J. RUTHERFORD. Note on a specimen of Curaçao aloes. Pharm. Jour. 112: 338. 1924.—An examination of a gourd packed with aloes found in a recent British shipment of Curaçao aloes indicates that it is apparently from the fruit of a *Cucurbita*, probably *Cucurbita maxima* and not the Calabash fruit, *Crescentia Cujete*, the woody shell of which has been so frequently employed as a container for aloes.—*E. N. Gathercoal.*

7441. JUMELLE, HENRI. Les Aponogeton malgaches. [The Aponogetons of Madagascar. Ann. Mus. Colonial Marseille 30²: 5-14. 1922.—The author in a previous article in the Annales (Les Monocotylédons aquatiques de Madagascar, 1916, 2nd fascicle) considered in a synoptical table the important characters of 9 species of *Aponogeton* of Madagascar, 3 of them new to science. In the present article, after a brief consideration of the group in general, amplified descriptions are given of the following 9 species recognized for this region: *Aponogeton fenestralis* Hook. f., *A. Guillotii* Hoch., *A. Boivinianus* Baill., *A. viridis* n.sp., *A. ulvaceus* Bak., *A. ambongensis* n.sp., *A. Bernierianus* Hook. f., *A. quadrangularis* Bak., and *A. cordatus* n.sp.—*L. M. Stupp.*

7442. JUMELLE, HENRI. Les Aracées de Madagascar. [The Araceae of Madagascar.] Ann. Mus. Colonial Marseille 27: 179-189. Pl. 1-3. 1919.—Six genera of Araceae from Madagascar—*Pistia*, *Hydrosme*, *Typhonodorum*, *Remusatia*, *Carlephyton*, and *Pothos*—each with but a single species, are described. The Indian genus *Remusatia* is recorded for the first time from Madagascar, and *Carlephyton* is established as a new genus, dedicated to M. Carle, the Chief of the Department of Colonization. The new species is *Carlephyton madagascariense*. A key for the genera is included.—*L. M. Stupp.*

7443. JUMELLE, HENRI. *Le Cycas Thouarsii*. Ann. Mus. Colonial Marseille 30²: 15-16. 1922.—This is a brief article of a Madagascar *Cycas* of which a photograph was given in a previous volume of the Annales (La Vegetation Malgache, par M. Perrier de la Bathie, 1921, p. 81). This *Cycas*, originally described by Robert Brown, is common on the east shore of Madagascar. The natives call it *fatra* and a legend connected with the plant is related. Its description is included.—*L. M. Stupp*.

7444. KOSCIEJOWSKI, WLADYSLAW. *Nowa forma rodzaju Alektorolophus i jej biologiczne przystosowania*. [A new form of the genus *Alectorolophus* and its biological adaptation.] Acta Soc. Bot. Poloniae 1: 43-46. Pl. 1. 1923.—The author describes *Alectorolophus longibracteatus* as new from Poland.—*C. W. Dodge*.

7445. PITARD, J. Rubiacées. [Rubiaceae.] In: LECOMTE, H. Fl. Indo-Chine 3: 289-432. Fig. 25-34. Feb., 1924.—In the present number the author concludes the treatment of the genus *Knoxia* and continues through the genus *Coelospermum* and *Gynochthodes* in part. The following new genera, species, varieties, and combinations are included: *Knoxia brachycarpa* Br. var. *congesta*, *Canthium cambodianum*, *C. glabrum* Blume var. *pedunculatum*, *C. didymum* Roxb. var. *rostrata* Thwaites, *C. cochinchinense* and var. *longifolium* Pierre, *C. filipendulum* Pierre, *C. coffeoides* Pierre, *C. siamense* (*Plectronia siamensis* K. Sch.), *Vangueria spinosa* Roxb. var. *tomentosa*; *Ixora pubigera*, *I. villosa* Roxb. var. *Chevalieri*, *I. dongnaiensis* Pierre, *I. polyantha* Wight var. *Champeauxiana*, *I. Spirei*, *I. eugenoides* Pierre, *I. Delphyana* Pierre, *I. Balansae*, *I. gracilipes* Pierre, *I. diversifolia* Wall. var. *flexilis*, *I. flavescescens* Pierre, *I. flavescescens* Pierre var. *cambodiana*, *I. krewanhensis* Pierre, *I. krewanhensis* Pierre var. *polita* Pierre, *I. cuneifolia* Roxb. var. *varians*, *I. mekongensis*, *I. cambodiana*, *I. nigricans* Br. var. *ovalis* Pierre, *I. laotica*, *I. coccinea* L. var. *caudata* Pierre, *I. stricta* Roxb. var. *mekongensis* Pierre; *Pavetta indica* L. vars. *nigrescens* Pierre, *hispida* Pierre, and *canescens*; *Duperrea* Pierre n. gen., *D. pavettaefolia* (*Mussaenda pavettaefolia* Kurz), *D. pavettaefolia* var. *scabra* (*Ixora debilis* Drake); *Coffea cochinchinensis* Pierre, *C. dongnaiensis* Pierre; *Hymenodocarpum* Pierre n. gen., *H. odoratum* Pierre; *Psychotria sralensis* Pierre, *P. pseudo-Ixora*, *P. pseudo-Ixora* var. *orientalis* Pierre, *P. tonkinensis*, *P. Fleuryi*, *P. Bonii* (*P. montana* Drake), *P. condorensis* Pierre, *P. serpens* L. vars. *membranacea* Pierre (*P. sarmentosa* Bl.) and *latifolia* Pierre, *P. Balansae* (*P. rhinocerotis* Drake), *P. mekongensis*, *P. rhodotricha*, *P. baviensis* (*Uragoga baviensis* Drake), *P. oligoneura* Pierre, *P. Poilanei*, *P. cambodiana* Pierre, *P. Lecomtei*, *P. chasaliaefolia*, *P. Harmandii*, *P. Thorelii*; *Chasalia ovoidea* Pierre; *Cephaelis Harmandiana* Pierre, *C. Lecomtei*; *Lasianthus Lecomtei*, *L. Eberhardtii*, *L. Harmandianus* Pierre, *L. tonkinensis* (*Mephitidia tonkinensis* Drake), *L. annamicus*, *L. langkokensis* (*M. langkokensis* Drake), *L. baviensis* (*M. baviensis* Drake), *L. cyanocarpus* Jack vars. *asperatus* Pierre, *lucidulus* Pierre, and *bracteatus*; *L. cambodianus*, *L. hoaensis* Pierre, *L. hoaensis* Pierre var. *microphyllus*, *L. Chevalieri*, *L. condorensis* Pierre, *L. Pierrei*, *L. repoeuensis* Pierre, *L. saptosmoides*, *L. dinhensis* (*Mephitidia chinensis* Drake); *L. dinhensis* Pierre vars. *tonkinensis* and *glabrescens* Pierre, *L. Thorelii*, *L. caeruleus*, *L. tamirensis* Pierre, *L. cupreus* Pierre, *L. kamputensis* Pierre, *L. hispidulus* (*Mephitidia hispidula* Drake), *L. rhinocerotis* Blume var. *pedunculata*, *L. foetidissimus* A. Chev., *L. Balansae* (*Mephitidia Balansae* Drake), *L. Poilanei*; *Saprosma inaequilongum* Pierre, *S. verrucosum*, *S. cochinchinense* Pierre, *S. Chevalieri*, *S. longifolium*, *S. gracile*, *S. ternatum* Hook. var. *glabrum* Pierre, *S. annamense* Pierre; *Leptodermis Lecomtei*; *Paederia consimilis* Pierre, *P. microcephala* Pierre, *P. Thorelii*; *Morinda umbellata* L. var. *tonkinensis*, *M. persicaefolia* Ham. vars. *oblonga*, *pandurifolia* (*M. pandurifolia* O. Kuntze), and *Talmyi*; *Prismatomeris Harmandii*, *P. sessiliflora* Pierre; and *Coelospermum morindiforme* Pierre.—*Fanny Fern Smith*.

7446. POLE EVANS, I. B. The flowering plants of South Africa. 2⁸. Pl. 71-80. 1922; 3⁰⁻¹¹. Pl. 81-110. 1923.—These numbers contain descriptions and colored plates of the following species: *Dauberrya aurea* Lindl. var. *coccinea* Marloth (*D. coccinea* Harv.), *Stapelia Pillansii* var. *attenuata* N. E. Br., *Mesembryanthemum crassipes* Marloth n. sp., *Leucospermum tottum* R. Br. var. *glabrum* Phillips n. var., *Ornithogalum Roodiae* Phillips n. sp., *Protea recondita* Buek., *Crossandra Greenstockii* S. Moore, *Roodia* N. E. Br. n. gen. of the Aizoaceae, *R. digitifolia* N. E. Br., *Bauhinia Galpinii* N. E. Br., *Klattia Stokoei* L. Guthrie, *Clematopsis Stanleyi* Hutchinson, *Mimetes hottentotica* Phillips & Hutchinson n. sp., *Senecio Medley-Woodii* Hutchinson n. sp., *Protea compacta* R. Br., *Gerbera plantaginea* Harv., *Aloe variegata*

L., *Ceratotheca triloba* E. Mey., *Dicoma Zeyheri* Cass., *Hyobanche Fulleri* Phillips n. sp., *Romulea Austinei* Phillips n. sp., *Lachenalia Roodeae* Phillips n. sp., *Brunia Stokoei* Phillips, *Hoodia Bainii* Dyer, *Tritonia Mathevsiana* L. Bolus, *Leucospermum cordatum* Phillips, *Aloe saponaria* Haw., *Synnotia Metelerkampiae* L. Bolus., *Chrysophyllum magalismontanum* Sond., *Cyrtanthus helictus* Lehm., *Protea Stokoei* Phillips n. sp., *Greyia Radlkoferi* Szyszy., *Mesembryanthemum digitatum* Ait., *Brachycorythis pubescens* Harv., *MacKaya bella* Harv., *Adenium oleifolium* Stapf. var. *angustifolium* Phillips n. var., *Craterostigma plantagineum* Hochst., *Aloe comosa* Marloth & Berg., *Protea pityphylla* Phill. var. *latifolia* Phillips n. var., *Triaspis Nelsoni* Oliv., and *Mesembryanthemum Pillansii* Kensit. Many are figured and described for the 1st time.—*E. P. Phillips.*

7447. ROSE, J. N. *Dudleya arizonica*. *Addisonia* 8: 35. Pl. 274 (col.). 1923.—A species of the family Crassulaceae, native of western Arizona, is here proposed as new. It is an erect or sprawling herb, with dark red, pedicelled flowers in secund racemes. Its closest ally is *Dudleya pulverulenta* Britt. & Rose.—*T. J. Fitzpatrick.*

7448. SMITH, WILLIAM WRIGHT. Notes on Chinese lilies. *Trans. & Proc. Bot. Soc. Edinburgh* 28: 122-160. Pl. 4-7. 1922.—The author discusses the Chinese lilies under 5 subheadings: (1) *Lilium taliense* Franchet, and its allies; (2) The lilies in Herb. Léveillé; (3) *Lilium Davidi* Franchet, and its allies; (4) *Lilium Duchartrei* Franchet, and its allies; and (5) *Lilium Bakerianum* Coll. & Hemsl., and its allies.—*L. R. Abrams.*

7449. SMITH, WRIGHT, AND JAMES SMALL. *Formania*: A new genus of the Compositae from Yunnan. *Trans. & Proc. Bot. Soc. Edinburgh* 28: 91-92. Pl. 2. 1922.—This new genus, allied to *Chrysanthemum*, is dedicated to Rev. Adam Forman. One species, *Formania mekongensis* W.W. Sm. & J. Small, is described. It is an aromatic shrub with pale yellow flowers, from Bei Ma Shan, Mekong-Yangtze divide, Yunnan, collected by G. Forrest (No. 13,183, August, 1914) at 10,000 feet altitude and latitude 28° 20' N.—*L. R. Abrams.*

7450. SMITH, WRIGHT, AND JAMES SMALL. *Parasenecio*: a new genus of the Compositae from China. *Trans. & Proc. Bot. Soc. Edinburgh* 28: 93-97. Pl. 3. 1922.—This new monotypic genus is related to *Cremanthodium* and to the *Ligularia* section of *Senecio*. The single species here described as *P. Forrestii* W. W. Sm. & J. Small is a perennial herb from western China. It was collected by G. Forrest (No. 16,788 and No. 17,074, August, 1918) in the Mu-li Mountains, southwestern Sze-chuen at 12,000 feet altitude and latitude 28° 12' N.—*L. R. Abrams.*

7451. TURRILL, W.B. *Dunn's wattle*. *Kew Bull.* 1922: 298-299. 1922.—*Acacia Dunnii* is described and proposed as new. It is distinguished from its allies, *A. platycarpa* F. Muell. and *A. sericea* A. Cunn., by having glabrous phyllodes and wingless pods. The type locality is fissures in hard quartzite rock near Victoria river, Northern Territory, northwestern Australia, where it was collected by E. J. Dunn after whom the species is named.—*T. J. Fitzpatrick.*

7452. URBAN, IGNATIUS. *Plantae cubenses novae vel rariores a clo. Er. L. Ekman lectae* I. [New or rare plants of Cuba collected by Er. L. Ekman.] *Symbolae Antillanae* 9: 55-176. 1923.—The author records the several stations where collections were made, together with the dates and numbers of specimens associated with the respective stations. Three families have been elaborated by specialists, namely the Orchidaceae by R. SCHLECTER, the Aquifoliaceae by TH. LOESENER, and the Sapindaceae by L. RADLKOEFER. Urban is the author of all combinations except as otherwise indicated. The following new genera, species, varieties and combinations are included: *Polystachya cubensis* Schltr., *Stelis cubensis* Schltr., *S. Ekmanii* Schltr., *Pleurothallis Ekmanii* Schltr., *Lepanthes blepharantha* Schltr., *L. Ekmanii* Schltr., *L. Lindmaniana* Schltr., *L. longicruris* Schltr., *L. melanocaulon* Schltr., *L. pergracilis* Schltr., *L. turquinoensis* Schltr., *Encyclia acutifolia* Schltr., *Maytenus splendens*, *Rhacoma revoluta*, *R. ternifolia*, *Ilex cristalensis* Loes., *I. pubipetala* Loes., *I. Ekmaniana* and var. *Regnelliana* Loes., *I. nitida* (Vahl) Maxim. var. *bahiahondica* Loes., *I. repandoides* Loes., *I. Grisebachii* Maxim. var. *nipensis* Loes., *I. ligustrina* Jacq. var. *minutiflora* (Rich.) Loes. f. *Ekmanii* Loes., *I. occidentalis* Mefad. var. or f. *maestrana* and var. or f. *rotundifolia* Loes., *Thouinia cubensis* Radlk., *Myrtus oligantha*, *M. Ekmanii*, *M. tripliphylla*, *M. moana*, *M. micarensis*, *Psidium paucinerve*, *P. tenuirame*, *P. reversum*, *P. baliu*, *P. versicolor*,

Myrica manacalensis, *M. pungens*, *M. retivenia* (*Eugenia retivenia* C. Wr.), *M. apodocarpa*, **Mozartia**, n. gen. of Myrtaceae, *M. Gundlachii* (*Myrica Gundlachii* Krug & Urb.), *Plinia formosa*, *P. punctata*, *P. stenophylla*, *Calytranthus heterochroa*, *C. oblanceolata*, *C. ramosissima*, *C. oligantha*, *C. leptoclada*, *C. polyneura*, *C. elongata*, *C. bialata*, *C. monocarpa*, *C. apoda*, *C. cardiophylla*, *C. paradoxa*, *Eugenia stereophylla*, *E. mensurenensis*, *E. buxoides*, *E. bayatensis*, *E. excisa*, *E. laeteviridis*, *E. acrantha*, *E. organosia*, *E. nodulosa*, *E. oxyssepala*, *E. papayoensis*, *E. oligadenia*, *E. stenoxipha*, *E. eriantha*, *E. oonophylla*, *E. psiloclada*, *E. nematopoda*, *E. gibberosa*, *E. maestrensis*, *E. leiophloea*, *E. piedraensis*, *E. adenoclada*, *E. fajardensis* (*E. fragrans* var. *fajardensis* Krug & Urb.), *E. cupuligera*, *Calycorectes Ekmanii*, *Tetrzygia elegans*, *Miconia baracoensis*, *M. cerasiflora* and var. *setulifera*, *M. remotiflora*, *M. Nystroemii*, *M. Petersonii*, *M. urceolata*, *M. pterosepala*, *M. monocephala*, *Pachyanthus Lindmanii*, *P. discolor* Norlind, *P. mayarensis*, *Henriettella Ekmanii*, *H. gibberosa*, *Ossaea turquinensis*, *O. pilifera*, *O. Ekmanii*, *O. ovatifolia*, *O. Norlindii*, *O. granulata*, *Mouriria maestralis*, *M. monantha*, *Hygrophila bayatensis*, *Ruellia Shaferiana*, *R. parvifolia*, *R. longipes*, *Stenandrium ovatum*, *S. crenatum*, *S. Ekmanii*, *S. glabrescens*, **Phidiasia** n. gen. of Acanthaceae, *P. Lindavii*, *Drejerella tomentosula*, *D. calcicola*, *D. maestrensis*, *Portlandia polyneura*, *P. brachycarpa*, *P. oblanceolata*, **Schmidtottia** n. gen. of Rubiaceae, *S. monantha*, *S. uliginosa* (*Portlandia uliginosa* Wernham), *S. elliptica* (*Portlandia elliptica* Britt.), *S. cubensis* (*Isidorea cubensis* Standl.), *S. marmorata*, *S. nitens* (*Portlandia nitens* Britt.), *S. multiflora*, *S. sessilifolia* (*Portlandia sessilifolia* Britt.), *S. Shaferi* (*Portlandia Shaferi* Standl.), **Siemensia** n. gen. of Rubiaceae, *S. pendula* (*Portlandia pendula* C. Wr.), **Nernstia** n. gen. of Rubiaceae, *N. mexicana* (*Coutarea mexicana* Zucc. & Mart.), **Coutaportia** n. gen. of Rubiaceae, *C. Ghiesbreghtiana* (*Portlandia* (*Coutaportia*) *Ghiesbreghtiana* Baill.), *Oldenlandia polyphylla*, *Ariadne Shaferi* (*Neomazaea Shaferi* Standl.), *Acrosynanthus minor*, *A. ovatus*, *Rondeletia pycnophylla*, *R. minutifolia*, *R. elliptica*, *R. coronata*, *R. apiculata*, *R. plicatula*, *R. azulensis*, *R. steiophylla*, *R. Norlindii*, *Catesbaca flaviflora*, *Guettarda elegans*, *Antirrhoea multinervis*, *A. abbreviata*, *Phialanthus parvifolius*, *P. oblongatus*, *P. ellipticus*, **Eosanthus** n. gen. of Rubiaceae, *E. cubensis*, *Chiococca cubensis*, *Scolosanthus granulatus*, *Psychotria sphaeroidea*, *P. cathetoneura*, *P. pachythalla*, *P. Ekmanii*, *P. graminifolia*, *Palicourea purpurascens*, *P. cyanea*, *Peratanthe cubensis*, *Spermacoce oligantha*, *S. exasperata*, *Mitracarpus tenuis*, *Buxus Ekmanii*, *B. olivacea*, *B. excisa*, *B. pilosula*, *B. heterophylla*, *B. obovata*, and *B. imbricata*.—J. M. Greenman.

7453. VIGUIER, R. **Araliacées.** [Araliaceae.] In: LECOMTE, H. Fl. Indo-Chine 2: 1158-1182. Fig. 137-141. August, 1923.—The present number includes a treatment of the genera from *Aralia* to *Gilibertia*. The new species, *Schefflera Thorelli* and *Gilibertia Chevalieri*, are included.—Fanny Fern Smith.

7454. WALL, A. **Raoulia mammillaris** Hook, f. Rec. Canterbury Mus. [New Zealand] 2: 105-109. Pl. 21. 1923.—The author shows that the original description of *Raoulia mammillaris* errs in describing the plant as forming large mounded masses. It proves to be a small plant, known at present only on Mt. Torless, Canterbury, and the neighboring ranges.—H. H. Allan.

REVISIONS AND MONOGRAPHS

7455. BURTT-DAVY, J. A revision of the South African species of *Dianthus*. Kew Bull. 1022: 209-223. Pl. 1-2. 1922.—Considerable general preliminary matter is given bearing on the genus, its geographical distribution, previous work done, etc. Seventeen species and 3 varieties are recognized, delimited and annotated, and the whole is provided with suitable keys. The following species and varieties are proposed as new: *Dianthus micropetalus* Ser. var. *Galpini*, *D. Pearsonii*, *D. transvaalensis*, *D. Bolusii* and var. *luteus*, *D. junceus*, *D. Kirkii*, *D. basuticus*, and *D. mooiensis* Williams var. *dentata*. The plates reproduce photographs of 3 sheets in the Thunberg herbarium giving his types of *D. scaber*, *D. caespitosus*, and *D. crenatus*.—T. J. Fitzpatrick.

7456. CHERMEZON, H. Revision des Cypéracées de Madagascar. [A revision of the Cyperaceae of Madagascar.] Ann. Mus. Colonial Marseille 27²: 29-87. 1919; 30¹: 1-62. 1922.—The author recognizes 8 genera, 141 species and several varieties of the Cyperaceae in Madagas-

car. The genera represented are: *Kyllingia* (14 spp.), *Mariscopsis* (1 sp.), *Tourlinium* (1 sp.), *Courtoisia* (1 sp.), *Mariscus* (21 spp.), *Pycreus* (25 spp.), *Juncellus* (3 spp.), and *Cyperus* (75 spp.). The following new species, varieties, and combinations are included; *Mariscus Kraussii* Hochst. var. *capitatus* (*Cypérus capitatus* Poir.), *M. Sieberianus* Nees var. *nossibeensis* (*M. nossibeensis* Steud.), *Pycreus Commersonii* (*Cyperus Commersonii* C. B. Clarke), *P. ferrugineus* C. B. Clarke var. *Baroni* (*Cyperus polystachyus* R. Br. var. *Baroni* C. B. Clarke), *Cyperus betafensis* (*C. cuspidatus* Baker, not HBK.), *C. confusus* Cherm. var. *tsiafajavontensis*, *C. Herana* Cherm var. *angustifolius* (*C. latifolius* Poir. var. *angustifolius* Krauss), and *C. platystachys* (*C. rotundus* L. var. *platystachys* Bojer).—L. M. Stupp.

7457. CHOUX, PIERRE. *Nouvelles Etudes biologiques sur les Asclépiadacées de Madagascar*. [Recent biological studies of the Asclepiadaceae of Madagascar.] Ann. Mus. Colonial Marseille 31²: 1-51. Pl. 1-4. 1923.—The present paper records the results of a detailed study of 19 species of Asclepiadaceae from a morphological, biological, and systematic standpoint. Several of the species studied were found to be extremely polymorphic and impossible of subdivision into subspecies or varietal categories. An intimate knowledge of the plants concerned has made it possible for the author to present important notes on and amplified descriptions of previously published species. The development of tubers is reported for several members of the genus *Cynanchum*. Descriptions of the following new species are included: *Cynanchum papillatum*, *C. appendiculatum*, *C. andringitrense*, and *Ceropegia Perrieri*. Two new combinations are given, namely, *Marsdenia grandiflora* (*Stephanotis grandiflora* Dene.) and *M. Thouarsii* (*S. Thouarsii* Brongn.).—L. M. Stupp.

7458. GÉRALD, FÉLIX. *Etude systématique, morphologique et anatomique des Chlaenacées*. [A systematic, morphological, and anatomical study of the Chlaenaceae.] Ann. Mus. Colonial Marseille 27¹: 1-135. Pl. 1-13. 1919.—The author has made a comprehensive study of the Chlaenaceae, a comparatively small family of plants all natives of Madagascar. Following a brief history of the group, the general morphological characters are considered. Seven genera are recognized, namely, *Sarcochlaena*, *Xerochlamys*, *Leptochlaena*, *Rhodochlaena*, *Schizochlaena*, *Eremochlaena* and *Xylochlaena*, and a key is given for their identification. The anatomical structure of each genus is discussed; the relationship of the Chlaenaceae to allied families is presented; and the geographical distribution of the several species in Madagascar is emphasized. The following species are described for the first time; *Sarcochlaena oblongifolia*, *Xerochlamys arenaria*, *X. elliptica*, *X. villosa*, *X. rupestris*, *X. acuminata*, *X. tampoketsensis*, *Rhodochlaena parviflora*, *Schizochlaena viscosa*, *Xylochlaena Perrieri*, and *Eremochlaena rotundifolia*. The article closes with an account of the adaptation of the different members of the family to soil and other environmental conditions, and with a consideration of their economic value and vernacular names.—L. M. Stupp.

7459. JUMELLE, HENRI. *Les Chrysalidocarpus, Palmiers de Madagascar*. [Palms of Madagascar.] Ann. Mus. Colonial Marseille, 30³: 1-32. 1922.—The author contrasts *Chrysalidocarpus* with *Dypsis* and *Neophloga* and points out the morphological characters distinguishing the 3 closely related genera. Eighteen species of *Chrysalidocarpus* are recognized, a key is provided for their identification, and full descriptions in French are given for each species. The following species are new to science: *Chrysalidocarpus paucifolius*, *C. fibrosus*, *C. acuminum*, *C. midongensis*, *C. arenarum*, *C. propinquus*, and *C. ankaizininensis*.—L. M. Stupp.

7460. SHERFF, EARL E. *North American species of Taraxacum*. Bot. Gaz. 70: 329-359. Pl. 31-33. 1920.—A brief discussion of the genus in North America is given, followed by a key to the species. Five species are recognized for North America: *Taraxacum lyratum* (Led.) DC., *T. ceratophorum* (Led.) DC., *T. eriophorum* Rydb., *T. vulgare* (Lam.) Schrank, and *T. laevigatum* (Willd.) DC. These are given extended Latin descriptions and accompanied with lists of *exsiccatae*.—E. E. Sherff.

FLORISTICS AND PLANT DISTRIBUTION

7461. [AITKEN, R. D.] *Researches on the vegetation of Natal, Series 1, Section V. The distribution and ecology of the Genus Cussonia (Thumb.), with some remarks upon its probable evolutionary history*. Mem. Bot. Surv. South Africa 5: 56-70. Pl. 1-3. 1923.—

This gives a general description of the genus *Cussonia* and a dichotomous key to the species, based upon the account in Engler's Pflanzenfamilien, as well as a detailed description of the distribution and ecology of the various species. It is shown that *C. spicata* is the most widely distributed and that it occurs in 2 very diverse ecological habits. A study is made of leaf-form in the various species, which are arranged in order of increasing leaf division. *C. spicata* and *C. Krausii* having the most highly compound leaves. The juvenile leaves of *C. spicata*, *C. paniculata* and *C. thyrsoflora* are simple and show a gradual transition to the compound adult leaves. It is concluded that leaf division may therefore be used as a criterion of evolution within the genus, and a comparison is made of the distribution of the simple- and compound-leaved species. This is considered to be suggestive of a tropical origin for the genus. Both in leaf and inflorescence characters, *C. spicata* is regarded as the most advanced species. It is also the most variable and widely distributed.—*L. J. Goldblatt.*

7462. BARNETT, F. **Leeds natural history records.** *Naturalist* 1924: 127. 1924.—Some records made by members of the Leeds Naturalists Club during 1923 include *Archangelica sylvestris* at Woodlesford and *Viola calcarea* at Hook Moor and Ledsham, both new county records.—*W. H. Burrell.*

7463. BEAN, RALPH C. **Some Maine orchids.** *Maine Nat.* 2: 78-81. 1922.—Twenty-five species collected in Clinton are listed.—*C. A. Weatherby.*

7464. BENNETT, ARTHUR. **Notes on Pinguicula.** *Trans. & Proc. Bot. Soc. Edinburgh* 28: 87-90. 1922.—Historical and distributional notes on *Pinguicula alpina* L., *P. grandiflora* Lam. and *P. lusitanica* L. are given.—*L. R. Abrams.*

7465. BOLUS, L. **The native trees and shrubs of Kirstenbosch.** *Jour. Bot. Soc. South Africa* 9: 7-11. *Pl. 1-11.* 1923.—Some indigenous Cape trees are described. A key founded mainly on leaf characteristics is given, which serves as a ready means of identifying local trees.—*L. J. Goldblatt.*

7466. COBURN, LOUISE H. **The flora of the state of Maine.** *Maine Nat.* 1: 70-72. 1921.—About 2000 species of vascular plants are now known to occur in Maine. The principal phytogeographic elements of this flora are briefly mentioned.—*C. A. Weatherby.*

7467. ELLIOT, G. F. SCOTT. **Alchemilla conjuncta Bab. in Dumfriesshire.** *Trans. & Proc. Bot. Soc. Edinburgh* 28: 97-98. 1922.

7468. FASSETT, NORMAN C. **Orchids collected at Ocean Point in the town of Boothbay, Lincoln Co., Maine.** *Maine Nat.* 2: 81. 1922.—Fourteen species are listed, with notes.—*C. A. Weatherby.*

7469. FIRTH, JOE. **Claytonia sibirica in the Ryeburn valley.** *Naturalist* 1923: 364. 1923.

7470. JOHNSTON, H. H. **Additions to the flora of Orkney, as recorded in Watson's Topographical Botany, second edition (1883).** *Trans. & Proc. Bot. Soc. Edinburgh* 28: 98-117. 1922.—Forty-two species, varieties, forms, and hybrids are added to the flora of Orkney. Of these 29 are native, 1 is naturalized, 10 are casuals, and 2 are planted.—*L. R. Abrams.*

7471. JOHNSTON, H. H. **Additions to the flora of Orkney, as recorded in Watson's Topographical Botany, second edition (1883).** *Trans. & Proc. Bot. Soc. Edinburgh* 28: 174-183. 1923.—Twenty-three species and varieties are recorded of which 10 are native, 1 is naturalized, 4 are casuals, and 8 are cultivated.—*L. R. Abrams.*

7472. HIERN, W. P. **Eleventh report of the botany committee.** *Trans. Devonshire Assoc. Adv. Sci. Lit. and Art* 51: 114-129. 1919.—This report comprises a compilation of records of new stations for Devonshire plants, obtained in part from recently published articles, the nature of which is briefly outlined. The number of species listed for the eight botanical districts of Barnstaple, Torrington, South Molton, Exeter, Honiton, Torquay, Plymouth and Tavistock includes 192 vascular plants, 47 mosses, 19 hepatics, 36 lichens, 23 algae and 7 fungi. A note on certain late flowering species and occasional comments as to habitat, abnormalities, etc. are included.—*A. F. Hill.*

7473. LARTER, C. E. **Twelfth report of the botany committee.** *Trans. Devonshire Assoc. Adv. Sci. Lit. and Art* 52: 122-129. 1920.—This report enumerates recent additions to the floristic records of Devonshire and lists 71 species of vascular plants, 23 fungi, 15 algae, 4 mosses and 1 liverwort. The botanical status of *Satureia Acinos* Scheele, collected at St.

Mary Church, Torquay, is discussed at some length, and phenological notes are included.—*A. F. Hill.*

7474. LARTER, C. E. Fourteenth report of the botany committee. Trans. Devonshire Assoc. Adv. Sci. Lit. and Art 53: 78-87. 1923.—This report continues the publication of new records for Devonshire plants and cites 93 species of vascular plants, 46 algae, 10 fungi and 1 moss, special mention being made of the appearance of *Epilobium angustifolium* L. in East Devon. A new red fruited variety of *Chenopodium polyspermum* L. is described as var. *erythrocarpum* Hiern. A few phenological notes are appended.—*A. F. Hill.*

7475. LILJEDAHL, ARTUR. *Senecio Fuchsii* Gmel. i Hälsingland. [*Senecio Fuchsii* in Hälsingland (province in Sweden).] Svensk. Bot. Tidskr. 17: 528-529. Fig. 1. 1923.—*Senecio Fuchsii* Gmel. is reported as new for Hälsingland, having been introduced.—*O. Heilborn.*

7476. MATTHEWS, J. R. Notes on Scottish plants. Trans. & Proc. Bot. Soc. Edinburgh 28: 170-173. 1923.—Notes or new records are given of several species of flowering plants collected mainly in Mid-Perth, vice-county 88, from the Lowland Earn district.—*L. R. Abrams.*

7477. MEZ, CARL. *Agrostis Schleicheri* Jord. et Verlot, ein neuer Bürger der Deutschen Flora. [*Agrostis Schleicheri* Jord. & Verlot, new to the flora of Germany.] Bot. Archiv 3: 60. 1923.—This plant, common in the Pyrenees and the Savoy Alps, is reported as occurring at Hohenschwangau, Bavaria, the most eastern point from which it has yet been reported.—*William Seifriz.*

7478. NORDHAGEN, ROLF. Botaniske notiser i-II. [Botanical notes I-II.] Videnskabs-selskab. Christiana Skrifter I. Mat.-Nat. Kl. No. 15. 16 p. 5 fig. 1922.—[With German résumé.] Note I. contains a description of the formation of sprouts in *Sedum villosum* L. and also observations on the biology of the flowers. Note II. contains observations on the hybrid, *Gymnadenia conopsea* × *G. albidia*, which is found at an altitude of 1220 metres in Central Norway, but which was previously known only from 2 localities on the Scandinavian peninsula. The plant is thoroughly described and figured.—*K. Münster Ström.*

7479. NYE, HARRIET A. Orchids of Fairfield and neighboring towns. Maine Nat. 2: 144-146. 1922.—An annotated list of 26 species is given.—*C. A. Weatherby.*

7480. NYLANDER, OLAF O. The orchids of northern Maine. Maine Nat 1: 22-24. 3 pl. 1921; 2: 64-69. 1 pl. 1921.—A list of 34 species with description and notes on distribution is given.—*C. A. Weatherby.*

7481. PACE, LULA. McLennan County plants. Univ. Texas Bull. 2340. 185-197. 1923.—This is a list of plants included in a geological report of the county.—*L. Pace.*

7482. PARLIN, JOHN C. Note on *Kalmia latifolia*. Maine Nat. 4: 44. 1924.—A station in Wells is recorded.—*C. A. Weatherby.*

7483. PEARSALL, W. H., AND F. A. MASON. Annual report, Yorkshire Naturalists Union 1923. Naturalist 1924: 59-60, 73-74. 1924.—The Botanical Section has notes on the weather and its influence on flowering and fruiting; there are also paragraphs on the year's work in botanical survey, bryology, plant galls, mycology and micro-biology.—*W. H. Burrell.*

7484. PEARSALL, W. H., AND F. A. MASON. Yorkshire Naturalists at Bedale. Naturalist 1923: 378-383. 1923.—The report contains notes on trees, flowering plants, and mosses.—*W. H. Burrell.*

7485. PITMAN, MRS. FRED H. In flowerland. Maine Nat. 2: 33-34. 1922.

7486. PITMAN, MRS. FRED H. Orchids in Winthrop. Maine Nat. 2: 35. 1922.—Eighteen species are listed.—*C. A. Weatherby.*

7487. RIKLI, M., UND E. RUEBEL. Ueber Flora und Vegetation von Kreta und Griechenland. [Flora and vegetation of Crete and Greece.] Vierteljahrsschr. Naturforsch. Ges. Zürich 68: 103-227. 1923.—The introductory paper consists of an annotated list of the vascular plants, with notes on the natural floristic affinities of the species. Separate lists are given for Crete, the Acropolis, Corinth, Olympia, Corfu, etc. Besides the special contributions by GUNNAR SAMUELSSON and by H. STEINER (which see), there is also a special discussion by E. Ruebel of the plant associations, describing the sclerophyll thickets and the forests; and an account of the distributional relations of the flora by M. Rikli in which among other data are listed the 118 known endemics of Crete.—*John H. Schaffner.*

7488. SALISBURY, E. J. *Salicornia dolichostachya* Moss. in Scotland. Trans. & Proc. Bot. Soc. Edinburgh 28: 87. 1922.—This species was found in the salt marsh near Gullane.—*L. R. Abrams.*

7489. SAMUELSSON, GUNNAR. Eine Exkursion nach Delphi und auf den Parnassos. [An excursion to Delphi and Parnassus.] Special contribution in "Flora und Vegetation von Kreta und Griechenland by M. RIKLI UND E. RÜBEL." Vierteljahrsschr. Naturforsch. Ges. Zürich 68: 176-179. 1923.—A brief description of the flora of the region with mention of the principal species observed on April 17 and 18, is given.—*John H. Schaffner.*

7490. SZAFAER, WLADYSŁAW. Zapiski florystyczne. [Floristic notes.] Acta Soc. Bot. Poloniae 1: 53-59. 1923.—The author reports new stations for rare Polish plants and discusses the synonymy of *Carlina onopordifolia* Bess.—*C. W. Dodge.*

7491. TURRILL, W. B. A contribution to the flora of the nearer east. Kew Bull. 1922: 291-298. 1922.—An annotated, descriptive list is given of 72 species of plants recently secured by various collectors in Greek Macedonia, Asia Minor, Macedonia, Palestine, Gallipoli, and the Island of Lemnos. A number of the plants are new to Europe, a few give interesting variations, and one, *Astragalus Durhamii*, is proposed as new, the type locality being Gallipoli. Its nearest affinity is *Astragalus ajubensis* Bunge of Mt. Ajub, southern Persia, with which it may be conspecific.—*T. J. Fitzpatrick.*

7492. WIERDAK, SZYMON. Bez Josiki (*Syringa Josikaea* Jacq. fil.) w Karpatach nad gornym Stryjem. [*Syringa Josikaea* Jacq. fil. in the upper part of the Stryi in the Carpathians.] Acta Soc. Bot. Poloniae 1: 85-89. Fig. 7. 1923.

7493. WILDEMAN, É. DE. Quelques Palmiers congolais. [Some Congo palms.] Ann. Mus. Col. Marseille 27: 1-28. 1919.—The author treats mainly of the genus *Raphia*, considering its distribution in the Congo, its economic value, its fruit, and the various names by which it is known at different stages of development. Other genera included are *Phoenix*, *Calamus*, *Oncocalamus*, *Eremospatha*, and *Ancistrophyllum*. A key is provided for species of the genus *Eremospatha*.—*L. M. Stupp.*

MISCELLANEOUS, UNCLASSIFIED PUBLICATIONS

SAM F. TRELEASE, *Editor*

7494. ANONYMOUS. The Naples Zoological Station. Nature 113: 449-450. 1924.—This is a note on the plans for continuing the work of the station.—*O. A. Stevens.*

7495. ANONYMOUS. The protection of scientific discovery. [Rev. of: RUFFINI, F. Report on scientific property. League of Nations. Committee on intellectual cooperation. A38, 1923, xii. 28 p. Geneva, 1923.] Nature 113: 593-595, 631-632. 1924.

7496. H., J. Mathematical biology. [Rev. of: FELDMAN, W. M. Biomathematics, being the principles of mathematics for students of biological science. xix + 398 p. C. Griffin and Co.: London, 1923.] Nature 113: 484-485. 1924.

7497. HASTINGS, E. G. Some questions of method in bacteriology. Jour. Bact. 9: 95-110. 1924.—This is the president's address, 25th annual convention, Society of American Bacteriologists, New Haven, Dec. 29, 1923. The faults and limits of some of the common bacteriological methods are stressed, particularly the tuberculin test and the agglutination test.—*C. E. Skinner.*

7498. PALMER, A. H. Weather insurance. Bull. Amer. Meteorol. Soc. 3: 67-70. 1922.—Insurance against loss due to rain, hail, frost, lightning, wind, drought, and flood can be obtained. As many as 100 forest fires may be started by lightning during one storm, and fire insurance is here an insurance against lightning. It is stated that 80% of all damage sustained by growing crops is caused by unfavorable weather. In certain agricultural regions considerable hail and frost insurance business is done. A recent tendency in crop insurance is toward a blanket policy covering all risks, thus relieving the farmer of numerous separate policies. Careless farming is, however, not encouraged. Weather insurance will aid agriculture, and help to stabilize business.—*Earl S. Johnston.*

